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CHILD DEVELOPMENT

By

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*Department of Psychology
Columbia University*

FIRST EDITION

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CHILD DEVELOPMENT

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To

R. S. WOODWORTH

and

A. T. POFFENBERGER

*Former Teachers and Present Colleagues
at Columbia University*

CONTENTS

	PAGE
PREFACE.	ix
I. THE HISTORY OF CHILD PSYCHOLOGY.	1
Attitude of Society toward Children.	1
Earlier Systematic Studies of Children.	3
Seventeenth Century	3
Eighteenth Century.	4
Nineteenth Century	5
Twentieth Century	7
Handicaps to Study of the Child	11
Methods Available for Study of the Child	13
II. PRINCIPLES OF DEVELOPMENT	20
Types of Change in Development.	20
Methods of Studying Development	23
Rates of Development.	25
Causes of Development	26
Experimental Studies of Maturation.	27
Characteristics of Development.	34
Factors Influencing Development	40
Developmental Periods.	43
III. PRENATAL DEVELOPMENT	46
Periods in Prenatal Development	46
Methods of Studying Prenatal Development	46
The Mechanisms of Intra-uterine Development.	49
Stages in Intra-uterine Development.	54
The Determination of Sex	62
Prenatal Nutrition	64
Neural Development.	65
Sense Organ Development	66
Multiple Births.	67
Maternal Impressions	69
Factors Influencing Prenatal Development.	70
IV. THE NEWBORN INFANT	76
Scientific Procedures in Studying the Newborn	77
Stage of Physical Development at Birth	78
Sleep of the Newborn	80
Motor Activities	81
Vocalization of the Newborn	88
Emotions of the Newborn	90
Sensitivities of the Newborn	94
Consciousness of the Newborn	100
Conditioning of the Newborn.	101

	PAGE
V. PHYSICAL GROWTH	102
Growth Cycles	103
Height	104
Weight	106
Physical Proportions	108
The Bones	111
The Teeth	113
The Muscles	115
Development of the Nervous System	115
Changes in Internal Organs	116
The Sex Apparatus	118
Diseases	123
VI. MOTOR DEVELOPMENT	124
Methods of Studying Motor Development	125
Characteristics of Motor Development	125
Sequences of Development	128
1. Motor Development in the Head Region	128
2. Motor Development of the Arms and Hands	130
3. Motor Development in the Trunk	138
4. Motor Development in the Legs	140
Later Improvements	148
Adolescent Awkwardness	149
Delayed Motor Development	150
Norms of Motor Development	155
VII. DEVELOPMENT OF SPEECH	157
Incentives to Speak	158
Methods of Studying Speech Development	158
Pattern of Speech Development	159
Preliminaries to Speech	161
Major Tasks in Speech Development	165
1. Comprehension	165
2. Building a Vocabulary	166
3. Forming Sentences	173
4. Pronunciation	176
Speech Disorders	177
The Content of Speech	180
Delayed Speech	183
VIII. EMOTIONAL DEVELOPMENT	187
How the Emotions Develop	187
Characteristics of Childhood Emotionality	194
Common Emotional Patterns of Childhood	197
1. Fear	197
2. Anger	202
3. Jealousy	205
4. Joy, Pleasure, Delight	208
5. Affection	211
6. Curiosity	214

CONTENTS

xiii

	PAGE
Sentiments.	215
Factors Influencing Emotionality	215
IX. SOCIAL DEVELOPMENT.	218
The Pattern of Social Development	219
Presocial Behavior.	220
Beginnings of Social Behavior.	221
Social Behavior in Early Childhood	225
The Gang Age	233
The Negative Phase.	239
Social Development in Adolescence	242
Choice of Companions.	244
Leadership.	249
X. PLAY	253
Value of Play.	254
Characteristics of Children's Play.	255
Play in Early Childhood.	259
1. Free, Spontaneous Play	259
2. Make-believe Play	261
3. Constructive Play	263
Toys.	264
Play in Late Childhood	267
1. Collecting	267
2. Games and Sports	269
3. Amusements.	271
Pets.	280
Factors Influencing Play.	280
XI. DEVELOPMENT OF UNDERSTANDING	285
Children's Concepts.	285
How Children Perceive Meanings.	287
Development of Meaning.	289
Experimental Investigations of Perception	29
1. Space Perception.	29
2. Perception of Weight	295
3. Number Concepts	296
4. Time Perception	297
5. Concepts of Self	299
6. Social Perception.	300
7. Aesthetic Perception	302
8. Perception of the Comic.	307
9. Errors in Perception	312
XII. MORAL DEVELOPMENT.	317
The Nature of Morality	317
Phases of Moral Development	318
1. Development of Moral Behavior	318
2. Development of Moral Concepts	320
Stages in Moral Development.	323
1. Morality in Babyhood.	323

	PAGE
2. Morality in Early Childhood.	322
3. Morality in Late Childhood	326
4. Morality in Adolescence.	329
Discipline	330
Punishment and Reward.	332
Factors Influencing Moral Development	334
Intelligence and Morality	338
Juvenile Delinquency	339
 XIII. DEVELOPMENT OF RELIGIOUS INTERESTS.	 342
Methods of Studying Religious Attitudes.	343
Early Religious Attitudes	344
Religion in Late Childhood.	347
Adolescent Religious Attitudes	350
Religious Awakening.	352
Religious Conversion	355
Religious Doubts	357
Religious Reconstruction.	360
 SEX DEVELOPMENT	 363
Methods of Studying Sex Development.	364
The Pattern of Sex Development	365
Stages of Sex Development.	366
1. Early Sex Behavior.	366
2. Period of Sex Antagonism	368
3. Sex Behavior in Adolescence.	371
Unhappy Love Affairs.	384
Curiosity about Sex.	386
Sex Education	389
Sexual Maladjustments	391
 XV. FORMS OF SELF-EXPRESSION	 391
Common Forms of Self-expression.	391
1. Volitional	391
2. Emotional Outbursts	400
3. Mannerisms.	401
4. Desire for Independence.	401
5. Desire to Appear Older	403
6. Possessions and Responsibilities	403
7. Choice of Life Career	404
8. Daydreams	407
9. Creative Fervor	411
10. Reforming Others.	418
11. Clothing.	419
 BIBLIOGRAPHY	 423
 INDEX.	 457

CHILD DEVELOPMENT

CHAPTER I

THE HISTORY OF CHILD PSYCHOLOGY

Introduction.—Child psychology, which studies the development of the child from conception to maturity, is recognized today as one of the most important of the specialized branches of psychological research. It is a phase of the study of the child which depends upon controlled observation and experimentation. Interest in the scientific study of the child has come from many sources, especially medicine, education, psychiatry, mental hygiene, sociology, and religion. Each has contributed its share of information to enable the psychologist to read out his own technical studies and then develop a complete picture of the typical development of the average as well as of the exceptional child.

Because the present-day interest in the study of the child is the culmination of an interest which began with educators and biologists of the seventeenth century, a short history of how child psychology has developed is useful as a background for an adequate understanding of the scientific investigations of children today. It will help us to see why research has advanced our knowledge of different phases of behavior much or little. It will show why certain of the important growth stages have been adequately investigated while other equally important ones have been almost completely neglected.

ATTITUDE OF SOCIETY TOWARD CHILDREN

The attitude of society toward the child has had a great deal to do with the interest or, rather, lack of interest in studying him. The few references made to children in history or fiction through the centuries can rather conclusively not only that the child's position in society has always been an unimportant one but also that little attention was given to the study of his development or capacities. What interest did exist was limited almost exclusively to that of the child's physical welfare. Definite information about the type and amount of clothing, food, exercise, and baths suitable for children of different ages is a part of the folklore of every country.

	PAGE
2. Morality in Early Childhood	322
3. Morality in Late Childhood	322
4. Morality in Adolescence	322
Discipline	330
Punishment and Reward	332
Factors Influencing Moral Development	334
Intelligence and Morality	338
Juvenile Delinquency	339
XIII. DEVELOPMENT OF RELIGIOUS INTERESTS	342
Methods of Studying Religious Attitudes	343
Early Religious Attitudes	344
Religion in Late Childhood	347
Adolescent Religious Attitudes	350
Religious Awakening	352
Religious Conversion	355
Religious Doubts	357
Religious Reconstruction	360
SEX DEVELOPMENT	363
Methods of Studying Sex Development	364
The Pattern of Sex Development	365
Stages of Sex Development	366
1. Early Sex Behavior	366
2. Period of Sex Antagonism	368
3. Sex Behavior in Adolescence	371
Urinary Love Affairs	384
Curiosity about Sex	386
Sex Education	389
Sexual Maladjustments	391
XV. FORMS OF SELF-EXPRESSION	391
Common Forms of Self-expression	391
1. Volition	391
2. Emotional Outbursts	400
3. Mannerisms	400
4. Desire for Independence	400
5. Desire to Appear Older	403
6. Possessions and Responsibilities	403
7. Choice of Life Career	404
8. Daydreams	407
9. Creative Fervor	1
10. Reforming Others	8
11. Clothing	19
BIBLIOGRAPHY	423
INDEX	457

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CHAPTER I

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Interest in Education for Adulthood.—Anthropologists tell us that among primitive peoples the position of the child within the tribe varied according to the degree of civilization attained by the tribe. In general, the attitude of primitive peoples was that the child's prime purpose in life was to be of use to his parents as he grew older. With this purpose in mind, the child was brought up to believe that when he reached adulthood he would supply his parents with food, clothing, and shelter; would take care of them in sickness and old age; would care for the family property; would make the sacrifices to the gods that their religion prescribed; and, in general, would be an asset to the family.

Instead of trying to understand the child and instead of allowing him to develop naturally, primitive peoples attempted to mold each child according to their standards of what a child should be. What little education was given was in preparation for the responsibilities he would be expected to assume as he approached maturity. Freedom for individual development was an unheard-of thing, and the child who could not or would not conform to social standards was regarded as unsatisfactory or considered a disgrace to the family.

A similar attitude toward the child prevailed among the ancient civilizations. In Greece and Rome, where the position of the child was important because he would, in time, be a citizen, an attempt was made to mold him according to the pattern of a citizen. Statesmen and philosophers concentrated their attention on his education as a preparation for the responsibilities which would some day be his. Even girls, as future mothers of citizens, were educated according to the approved standards. No thought, however, was given to the study of the nature of the child, and no attempt was made to develop him as an individual.

With the coming of Christianity, the child sank into an obscurity from which he did not emerge before the latter part of the Middle Ages. It was not until the reawakening of interest in the classics, during the Renaissance period, that an interest in the child and a study of his needs appeared. Gradually the attitude of the philosophers and teachers toward the child changed. Instead of planning an education designed to mold the child according to an approved standard, the child was made the starting point of education and was carefully studied before his education was planned.

At first, these reformers were able to command only slight attention. Gradually, however, as a result of their prestige as philosophers or educators, they were able to bring about a change in the attitude of society toward children. No longer was the child regarded as a little man or a little woman. No longer was it believed that children could be molded according to a pattern through an educational process designed for that

THE HISTORY OF CHILD PSYCHOLOGY

purpose. A new attitude toward children gradually developed, and as a result of this, child study became a reality.

Early interest in the study of the child thus came not from an interest in the child himself but from an interest in the best method of education to develop him into a useful citizen. Nevertheless, as information about the child increased, interest in the study of the child himself increased and the point of view toward the study of the child gradually changed from an indirect to a direct one. Today, the latter point of view definitely predominates.

EARLIER SYSTEMATIC STUDIES OF CHILDREN

Tracing through the history of child study which eventually developed into the science of child psychology, one can see definite periods in which a specific type of study predominated and later gave way to a different type of study, with emphasis on a new technique. From the time of the Renaissance to the present, there has been a growth of interest in the child and a transition from casual observation, primarily educational in interest, to planned and highly controlled experimental studies centered on the child as an individual, not as an educational problem.

In order to show how child psychology has developed through progressive stages, each century, beginning with the seventeenth, will be sketched briefly to show what it contributed to the study of the child. A few of the outstanding exponents of child study, together with their contributions to the field of investigation, will be recorded to show who were the forerunners of our modern child psychologists.

SEVENTEENTH CENTURY

The beginning of scientific child study dates back to the work of the famous Slavic educational reformer, Johann Amos Comenius, who published in 1628 his *School of infancy*, describing the type of education suitable for the first six years of life. The book was meant primarily for noble and wealthy families who wanted to bring up their children properly, and its influence was limited to those who could read. In 1657, Comenius published *Orbis pictus*, or the *World in pictures*, which is generally looked upon as the first picture book for children. The reading matter was illustrated with pictures to make it more understandable to the child. This was the first practical recognition of the fact that the child comprehends objective facts before he can understand abstract terms.

Historically, the work of Comenius is very important because this was the first time that the child was studied as an individual. Further-

more, it was the first attempt to educate the child according to his abilities rather than to mold him into a socially acceptable pattern as had been done in the past. Comenius stressed the fact that the child is not a miniature adult and therefore should not be treated as an adult but should be studied in his essential child nature so as to understand his capacities and know how to deal with them. This marks the true beginning of child study.

EIGHTEENTH CENTURY

There were two definite trends in child study during the eighteenth century. The first consisted of philosophical studies of education in which the child was studied only indirectly. The second was a direct study of the child through daily observations of one or more children. The influence of the philosophical studies was great, so far as educational reform was concerned; but relatively little knowledge of the child was obtained from them because the emphasis had been placed on the school rather than on the child. Observations of children in the home, without reference to schooling, proved to be far more fruitful because they focused attention upon the child himself.

Toward the end of the seventeenth century, in 1693, John Locke of England extolled natural methods as opposed to the disciplinary ones used in the education of children at that time. More than half a century later, Jean Jacques Rousseau of France, in his *Émile*, published in 1762 (1911),¹ described at length the application of his ideal of political freedom to the education of the child. Later came the educational reforms of Pestalozzi in Switzerland, and of Herbart and Froebel in Germany. Froebel, considered the founder of the kindergarten movement, summing up his ideals of education in his *Education of man*, published in 1826 (1887), based his materials on his careful observations of young children both at home and in school.

In the latter part of the eighteenth century, an interest in studying the child, aside from his education or home influences, made its appearance. Pestalozzi's notes, based on observations of the development of his 3½-year-old son, which appeared in 1774, may be looked upon as the first scientific record of the development of a young child. Several years later, in 1787, a German physician, Tiedemann, published his observations of the development of his own children during the first years of their lives. This study [now translated from the German by Murchison and Langer (1927)] was one of the first attempts to make a series of scientific observations on the behavior of young children. These two were forerunners of the biographical studies of children which became so popular during the nineteenth century.

¹ Dates in parentheses refer to items in the Bibliography, pp. 423-456.

NINETEENTH CENTURY

uring the early part of the nineteenth century, there was little interest in studying children. The result was that no real advance was made for more than 50 years. Then, during the latter part of the century, came a long succession of baby biographies, beginning with Taine's *Infant development* in 1876, emphasizing the child's acquisition of speech. One year later, in England, Darwin (1877) published his *Biographical sketch of an infant*.

Of all the baby biographies published abroad, Wilhelm Preyer's *Die Seele des Kindes* (The mind of the child) (1888), which appeared in 1881, is the outstanding contribution to the development of scientific child study. Preyer was a German embryologist who studied fetal chicks, rabbits, and guinea pigs. He also made systematic daily observations of his son from birth through the third year, with special attention to reflexes and the more elaborate forms of behavior that appeared later, taking extensive notes at the time the observations were made and later writing the biography from them. Comparisons revealed that animals and human infants show similar trends in development, especially in acquisition of control over the muscles. The real importance of Preyer's work lay in the fact that it served as a model for later research by directed observation and also paved the way for the development of more purely experimental techniques. For this reason, Preyer is often called the "father of child psychology."

America contributed its share of baby biographies. One of the earliest was made by the philosopher Bronson Alcott, father of Louisa M. Alcott, the author of *Little women*. He kept a record of the development of his eldest daughter, Anna, from the time of her birth and published this record in 1831. One year later, in 1832, he published a diary record of another daughter, Louisa, which he called, *Observations on the vital phenomena of my second child*.

The best known as well as the most thorough of the American baby biographies to make their appearance during the nineteenth century were Millicent W. Shinn's studies *Notes on the development of a child*, published in 1893 (1909), and *Biography of a baby*, in 1900 (1900), based on observations of her niece from birth through the first year. Shinn used Preyer's work as a model and compared her niece with Preyer's son. Following Shinn's study were other baby biographies, notably those of K. C. Moore (1896), D. R. Major (1906), G. V. N. Dearborn (1910), and others. Most of these appeared after the turn of the century.

Hall and the "Child Study" Movement.—The second important contribution to child psychology during the nineteenth century came from the interest aroused in the study of the child by G. Stanley Hall of Clark

University. Hall is often referred to as the "father of the child study movement" because of the popular interest he aroused by his baby biographies, philosophical and educational theories, and observational studies of individual children. He gave great impetus to this interest when he published in 1891 his *Contents of children's minds on entering school* (1891).

Through the influence of Hall, the child came to be looked upon as an individual person, and studies of his physical and mental capacities were made without reference to his education. Hall's students carried this point of view away with them when they completed their studies at Clark University, and soon an interest in studying the child himself became the paramount occupation of a group of psychologists and educators. From schools and universities this interest spread to parents in the home.

While it is true that hundreds of studies of almost every phase of child life made their appearance, nevertheless, because of the poorly controlled and, in many instances, nonscientific methods used, these studies have long since lost their value as sources of information. However, they served as the basis for the first textbooks in America and, as such, played a very important role until they were gradually supplanted by experimental studies. Their important and lasting contribution lies in the interest they created in the study of the child.

Child Study Societies.—As a result of the widespread popular and scientific interest in the study of the child, child study groups, scientific journals for reports on the study of different aspects of the child's development, and organizations to promote the well-being of the child came into existence. In 1893, at the time of the International Conference on Education, held at the Chicago World's Fair, Hall organized the National Association for the Study of Children, the first child study society in America. In the following year, 1894, a Department of Child Study was organized as a department of the National Education Association. Iowa, Illinois, Nebraska, and Kansas, in quick succession, formed child study associations. The movement spread abroad and resulted in the establishment of societies in England in 1894, in Poland in 1897, in Germany in 1899, and in France in 1901. The first International Congress for Child Study was held in Berlin in 1906.

Child Study Periodicals.—Interest was furthered through the establishment of the *Pedagogical Seminary* by Hall in 1891. In this journal appeared articles dealing with every aspect of individual development. The questionnaire method, popularized by Hall, resulted in the rapid accumulation of material relating to different phases of the mental life at all ages. Two years later, Sully, the founder of the British Association for Child Study, began his *Studies in Childhood* series which, in many respects, resembled Hall's *Pedagogical Seminary*. Following this were

experimental studies of children following closely along the lines of Watson's work appeared both in America and abroad.

2. The second trend of importance in child study during the twentieth century has been the development of interest in *specialized studies of the different capacities* of the child. No longer are the studies of a general sort as they were during the preceding century, as in the work of the baby biographers. Highly specialized investigations of learning, motor development, the emotions, language, socialization, play, drawing, moral and religious concepts have replaced them. The result has been a marked increase in more definite and factual information about the aspects of child life studied. The emphasis has not been evenly distributed; certain phases of child development, especially motor control, speech, emotions, and socialization, have been thoroughly investigated while other phases, equally important but more difficult to study, such as moral and religious concepts, dreams, play interests in the older ages, and curiosity about sex matters, have received too little attention. Yet, where the advances have been made, they are genuine achievements.

3. A third important trend in modern child study has been *the testing movement*. Beginning with the development of a standardized scale of tests for the measurement of general intelligence by Alfred Binet and Th. Simon in Paris in 1905, with subsequent revisions in 1908 and 1911, there was a long series of revisions and modifications of the original scale here in America by Goddard, Kuhlmann, Terman, Yerkes, Pintner, and many others. Following this has come the development of personality and special-aptitude tests, most of which are still in a semiexperimental stage and are designed primarily for children of six years of age or older.

Interest in testing has led to the study of *individual differences*, primarily sex, race, and social status differences, and to an investigation of such problems as the rate of growth of intelligence, and the *constancy* of the intelligence quotient over a period of time. Academic as they may sound, the findings of these studies have been used in a practical way in planning the school curriculum, in the placement of pupils in grades best suited to their abilities, and in vocational guidance and training.

4. Interest in *the maladjusted child* is the fourth important line of research which has engaged the attention of the child psychologist during the twentieth century. The intelligence test, originally designed by Binet to segregate children mentally too deficient to be able to do the work of the school grade in which they were placed, has proved to be a very valuable method of picking out children unsuited to the work of the regular school grades. These children are today placed in ungraded classes or institutions where the work is planned to meet their needs and capacities.

Children mentally normal but maladjusted to home, school, or social environments because of unfavorable training have likewise received increasing attention. Clinics modeled along the lines of that of Witmer have been opened in many of the larger cities and universities. Attention was centered on children with behavior deviations, and a well-rounded study of their physical, mental, and social development was made for the purpose of correcting undesirable behavior. In 1921, Thom opened a habit clinic for preschool children in Boston, which was the pioneer in its field. Instead of waiting until maladjustments develop to the point where they become serious problems, clinics of this sort are designed to nip the tendency in the bud.

Children maladjusted to normal child life because of their very superior intelligence have likewise received considerable attention from such psychologists as Lewis M. Terman at Stanford, and Leta S. Hollingworth of Teachers College, Columbia. The result of such studies has been the establishment of classes specially designed for the child of very superior intellectual ability and the planning of a curriculum adequately adjusted to his needs.

5. The latest trend in the study of the child during the twentieth century is *intensive research on the preschool child*. With the exception of the scattered biographical studies of babies and young children, the psychologist has, until recently, found himself in a position where it was almost impossible to study children under the age of six years, the beginning of the school age. This was due to the practical problem of getting hold of young children, except in the case of an occasional orphanage group.

Since the First World War, interest in the preschool child has developed rapidly. Nursery schools, kindergartens, and infants' health and mental hygiene clinics, as well as centers for research with preschool children connected with many of the large universities, have all made it possible for the psychologist to have at his disposal adequate numbers of the very young children for study. The result of this has been a tremendous flood of literature reporting experimental investigations of almost every aspect of development of the preschool child. As a consequence, instead of being one of the least understood of all the developmental ages, the period from birth to school entrance is today one of the most thoroughly investigated and best understood.

Different child psychologists view the child from different angles, depending on their own point of view or interest. Shirley has illustrated this well in the accompanying diagram (Fig. 1).

Here Shirley shows the four major divisions of the field of child psychology today, depending upon the point of view taken by the psychologist. In the nature-generic quadrant, the "generic" child is representative of the average as determined by a study of many

children. The point of view is that the child is swept to maturity by the dynamic forces of nature. This has led to an emphasis on such topics as the developmental process, age norms, individual differences, and limits of growth. In the nurture-generic quadrant, the influence of

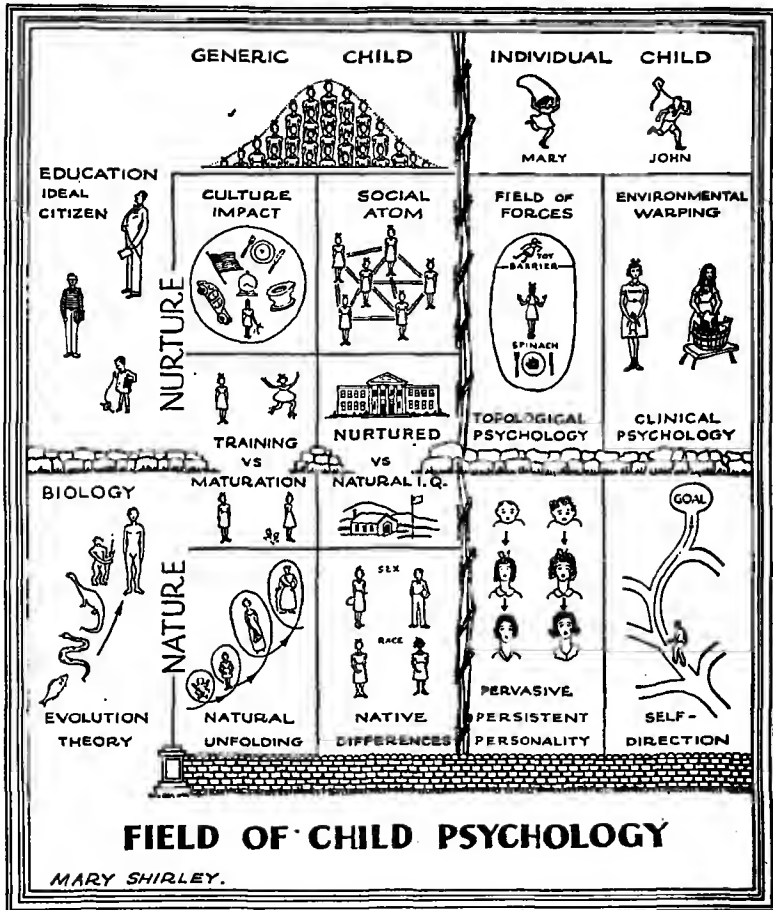


FIG. 1.—The field of child psychology, A.D. 1939. (From M. Shirley, in J. P. Guilford, *Fields of psychology*, Chap. IV. Van Nostrand, 1940.)

environmental forces and culture on the child's development is stressed. In the upper and lower right quadrants, the "individual" child, meaning the specific, flesh and blood child, is the center of interest.

HANDICAPS TO STUDY OF THE CHILD

From the brief historical sketch given above, it should be evident that delay in the development of child psychology of a scientific character was not due to lack of interest, but rather to handicaps, primarily social,

over which the scientist had little or no control. The most important of these handicaps were:

1. The Attitude of Society toward the Child.—Until very recently, the child was regarded as a *miniature adult*, and as such was assumed to be like an adult in physical and mental make-up. Throughout the eighteenth and nineteenth centuries, the theory that the child simply was a pint-sized adult was so popularly held that it had a pronounced influence on every phase of child life. Children wore clothing that reproduced in cut and style the clothes of their parents. Everyday activities, even play, were modeled along the lines of adult activities. Religious and moral instruction, suited to adult understanding, was given to children for whom comprehension of this instruction was impossible. Even in the psychological laboratories, children as subjects for experimental research were almost unheard of.

The belief that the child is a miniature adult has been broken down gradually through different sources. Rousseau (1911) tried, in his story of *Émile*, to show that the child is a distinct type of individual. "Childhood," he wrote, "has ways of seeing, thinking, and feeling, peculiar to itself." Comenius, Froebel, Pestalozzi, and Herbart urged much the same as the fundamental principle on which all education should be based. Gradually, with further evidence from later, more modern scientific studies to substantiate the contentions of these early educational reformers, the old attitude toward the child is gradually giving way to a new one. Now, the child is regarded as an individual, different and distinct in make-up from the adult.

2. Difficulties in Securing Children for Scientific Studies.—Strange as it may seem, it is nevertheless true that the problem of securing large and unselected groups of children for scientific research has been a troublesome and often insurmountable one. This, until very recently, has been especially serious in the preschool ages. When practically all babies were born at home, newborn infants were almost inaccessible to the scientist for study. Likewise, children who were too young to enter school remained at home or played with small groups of neighborhood children, which also made them inaccessible.

Now, fortunately for the scientist, much of this is changed. Babies are much more frequently born in hospitals than at home, and there is no longer an aversion to having them studied by scientists on the excuse that they are too delicate. Nursery schools, kindergartens, health and mental hygiene clinics, established in connection with schools, universities, and charity organizations, give the psychologist of today an excellent opportunity to study young children.

In place of the antagonism which formerly existed against interfering with the school routine to use school children as subjects for experimental

udies, many schools today are willingly cooperating with the scientist, and the problem of studying children of the elementary school years is gradually being solved. It is only during the adolescent years, the high-school and college ages, that the psychologist now has difficulty in getting as many children as he needs. And the difficulty here lies not with school authorities but with the students themselves, who are often reluctant to cooperate freely with the scientist on the grounds that studying them is prying into their private affairs.

3. Lack of Scientists Who Can Handle Children Successfully.—

In the early days, when psychology was a study taught almost exclusively in colleges or universities by men whose careers had been limited to the college classroom or laboratory, there were few scientifically trained psychologists who knew how to handle children, especially young children, well enough to be able to get normal reactions from them. Parents and teachers, on the other hand, who were accustomed to being with children and who therefore were able to study their normal reactions, lacked, in most cases, the training that is needed to make a scientific study.

Gradually, this handicap is being met satisfactorily. Men and women psychologists, who are familiar with children and who know how to deal with them, are being encouraged to specialize in child psychology and carry out their research work in that field. In addition to that, parents, nurses, and teachers, who are accustomed to handling children, often work with and under the guidance of trained psychologists.

4. Lack of Methods Suited to the Study of Children.—

In the first period, when psychology was merely an offshoot of philosophy, the introspective method, in which the subject reported what went on in his mind, was the only one in use. Because young children, especially those in the prespeech or early speech stages of development, were totally incapable of using this method, it became necessary for the psychologist to develop a new technique better suited to the study of the child. Many methods, as a consequence, have been tried out. A number of these have been discarded as inadequate or unreliable. In order to show how serious this handicap has been and how difficult it has been to overcome it, the methods most commonly used in former years as well as today will be analyzed here briefly, and their good and bad qualities given.

METHODS AVAILABLE FOR STUDY OF THE CHILD

1. Anecdote or "Armchair" Method.—

This is the oldest of the methods used to study the child. It consisted of a theoretical analysis of the child's behavior, based on previous observations, usually of a casual, desultory sort, made by the philosopher. Plato, in the fourth century B.C., used this method first in his analysis of the ideal education

for the child, as discussed in the *Republic*. Many philosophical theories of children have appeared since Plato's time, especially at the time of the educational reformers of the eighteenth century. Two outstanding examples of these are Rousseau's *Emile* and Locke's *Essay on human understanding*.

The great criticism of this method is that it is speculative and lacks basis in well-verified evidence. Instead of studying children directly, one draws on his memory of childhood experiences and on anecdotes he has heard about children. Little attempt is then made to substantiate the conclusions drawn by direct observations of children themselves.

2. The Biographical Method.—The baby biographers of the nineteenth century developed their own technique of studying children, which consisted of a day-by-day recording of events in the life of a child, supplemented at times by simple experiments on one or two children. Instead of relying on memory to supply data in regard to children's behavior, the biographer took down notes at the time he observed the child or shortly afterward. These notes later served as material for the completed record of the child's development.

While this method made it possible to observe the child in his everyday environment, free from the artificiality which is apt to accompany a laboratory study, nevertheless, this very lack of control over the environment made the observations less accurate than a scientific study requires. In addition to this, the impartial, unbiased attitude of the scientist was, in some instances, influenced by parental pride. Finally, as studies were generally limited to one child, usually the child of highly educated, intelligent parents, it was impossible to draw any generalized conclusions concerning the behavior of the *average* child.

In spite of these limitations, the method has its good points. It has proved to be an excellent supplement to laboratory studies of children and has paved the way for carefully controlled observations under conditions similar to those of the home or playroom. Its greatest value lies in the fact that it supplies data about child behavior not found in experimental studies which are, for the most part, limited to short observation or test periods. This is especially important in the early years of life when the child's behavior is spontaneous and cannot be elicited at will.

Recently a few attempts have been made to use the baby biography material, while at the same time eliminating many of the sources of criticism inherent in it. Dennis (1936) compiled a biography from 64 biographies of babies under three years of age. Later, Dennis and Dennis (1937) took data about the first year of life from 40 of the most complete biographies available and obtained information about 50 items of behavior. In this way, the criticism that data given in a biography are characteristic of one child alone has been eliminated. Hurlock and

McHugh (1936), to see whether data from baby biographers agree with data from other sources, compared a number of items from biographies with Mead's group of feeble-minded children, Terman's group of gifted individuals, Shirley's unselected group, and norms from baby tests.

3. The Autobiographical Method.—This method is often referred to as the "retrospective method" because it involves looking backward by the individual over the course of his life, in an attempt to piece together childhood memories into a more or less complete life history. It resembles the biographical method in that it traces the development of the child with emphasis on certain outstanding characteristics. But, unlike that method, it uses material related to the life of the biographer himself, rather than to that of others who have been observed by the biographer. How this method may be used is illustrated by Laird's (1923) study of incentives. Laird asked a group of students to think back to their high-school days and to recall, in a manner as impartial as possible, the effect that different incentives used by their teachers had had on their work. In a like manner, Hurlock and Klein (1934) attempted to study adolescent "crushes" by asking high-school, college, and medical-school students to answer certain questions about their "crush" behavior and attitudes of earlier years.

The sources of error in the autobiographical method are great. Relying upon memory is always subject to error, and this is especially true when a personal experience, colored by pleasant or unpleasant emotional accompaniments, is involved. Nevertheless, material derived from the use of this method, in spite of its inaccuracies, is often valuable because it throws light upon certain aspects of child life which can be studied in no other way.

4. The Questionnaire Method.—This method, which has been one of the most extensively used in the study of the child, is a large-scale reproduction of the biographical method. Its original purpose was to collect large masses of data relating to the topics investigated and thus eliminate, to a certain degree, the unreliability of the limited data obtained by the biographical and autobiographical methods.

At first, this method involved asking questions orally of each child studied. Because this proved to be too slow and laborious, it was modified to permit groups of children to write, as part of their classroom work, answers to sets of questions or compositions on definite topics. The material thus collected was then studied, tabulated, and recorded statistically, and generalized conclusions were drawn. In recent studies, the questionnaires have been printed and circulated widely among students, teachers, and parents.

The pioneer investigation of importance, using this method for child study, was G. Stanley Hall's (1891) *The contents of children's minds on*

entering school. He and four associates asked Boston school children 123 questions about common things in life, as, "Have you ever seen a hill, brook, woods, an island, a river?" "Where does milk, butter, meat, leather, cotton, wool, come from?" Following the model set in this study came further studies by Hall and his students, notably E. Barnes. Such topics as the child's sense of self, children's collections, children's fears, dreams, toys, and playthings were investigated through the use of this method. As a result, much material of value about child behavior was obtained, and many suggestions for further studies with more scientific methods were given.

This method has its good as well as its bad features. It has enabled the psychologist to investigate a broad problem, using many subjects, in a relatively short time. It furnishes valuable cues for further investigations and obtains data from sources, notably parents, that could be obtained by no other method. But there are many disadvantages which to a large extent offset the advantages. Owing to lack of understanding, the question is often either omitted or answered in a manner unrelated to the individual's point of view. There is no sure way to control the replies given or to be sure that the replies are not falsified to obtain, as many children believe, a higher school grade. During adolescence, there is often a resentful attitude toward what the adolescent believes to be prying into his personal affairs, and this leads to giving evasive answers or, in some instances, obviously untrue answers.

5. The Psychometric Method.—The psychometric, or testing, method of studying children consists of grading their behavior by means of a standardized test procedure. Following the pattern set by Alfred Binet in 1905, intelligence tests for all ages have been developed. Later, personality and special-aptitude tests, modeled along the lines of the intelligence tests, made their appearance. While these latter tests are better suited to the high-school and college years than to the elementary-school age, nevertheless, some data of value concerning the personality make-up of children have been derived from their use.

One chief value of the psychometric method is its accuracy, which comes from emphasis on carefully controlled environmental conditions. This very fact, however, often results in an artificial situation which produces an unfavorable emotional reaction that reduces the accuracy of the measurement.

6. The Method of Individual Diagnosis.—This method, a modification of the method used by the Freudian School in the study of adults, was first used by Witmer in the Psychological Clinic founded by him at the University of Pennsylvania in 1896. Modifications of the technique worked out by Witmer, notably the "play technique" advocated by Klein (1932) because of its suitability for the study of children, are

in habit and child guidance clinics and are limited to the study of the maladjusted child. Case studies, with careful attention to detailed analysis and comparison with so-called "normal" cases, have made this technique better than that of the earlier work in the same field.

In order to deal with problem children, the psychologist must obtain extensive information about the child studied. Case histories, composed of information regarding the personal and family history of the child, a developmental history, a record of physical condition, and information about his mental and emotional development, as well as a school record, all serve to give a more or less complete picture of the child. In order to obtain this material, the psychologist gets information from parental interviews, home visits and ratings, teachers' judgments, school tests and records, mental measurements, and from his own observations of the child's behavior. A typical example of such a case history is that of *Agnes*, made by Woolley (1925).

The method of individual diagnosis may be looked upon as one of the most accurate available today for the study of the child. It is limited in its use, however, to a group of highly trained psychologists who are familiar with maladjusted children and who know how to deal with such cases. It is a method which requires infinite patience and unlimited time to make possible a careful study of the child. As its main emphasis is on problem cases, it is generally reserved for the study of the problem child rather than the normal, average child.

7. The Controlled Observation Method.—This method consists of the observation of the behavior of the child under carefully controlled environmental conditions. It is an outgrowth of the biographical technique, which has been made more accurate by using groups of children, instead of a single child, by keeping environmental factors under control, and by eliminating the subjective factor as much as possible through the use of outlines, questionnaires, and record blanks to guide observation, and by taking moving pictures to supplement the observations. How carefully controlled the observations of children can be may be seen in the "isolation cabinet," designed for infant research at the Ohio State University. In it temperature, humidity, light, and sound are controlled.

The controlled observation method was first used in Germany in the study of the reactions of the newborn to sensory stimuli. With the continuation of the use of this method, it has been improved to the point where scientific accuracy is greatly increased. Watson (1925) at Johns Hopkins University in Baltimore used this technique for the first time in America in his experiments on the emotions of the newborn.

At Yale, Gesell (1932) introduced the moving-picture camera as an aid to observation of young children in 1926. He used the 24-hour observation technique in which the baby's behavior is observed and

recorded continuously for every minute of the 24 hours of the day. The observers who record the responses are kept out of the behavior picture by means of a one-way-vision screen so that the baby may be observed

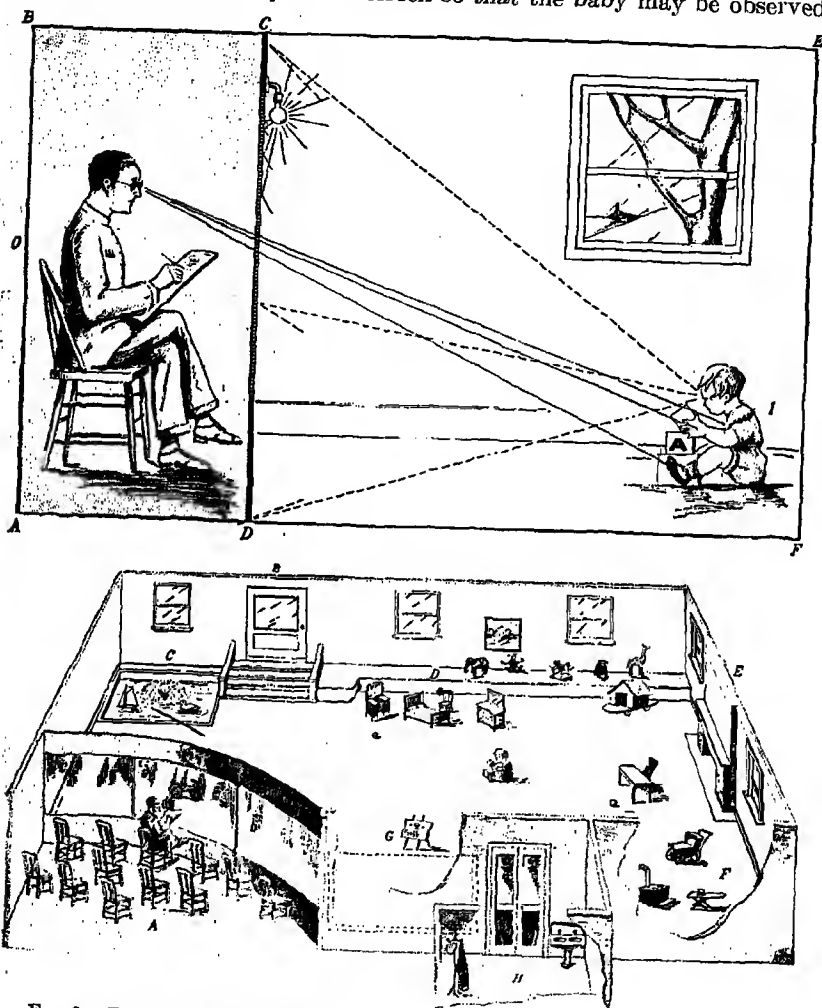


FIG. 2.—Device for segregative observation in the guidance nursery of the Yale Psycho-Clinic. The observers (*O*) sit in an alcove represented by *ABCD*, in the upper diagram and by *A* in the lower diagram. The infant (*I*) is on the floor of the nursery *ABEF*. A 16-mesh wire screen separates *O* from *I*. It functions as a visual sieve permitting one-way vision only. (From A. Gesell, *Infancy and human growth*. Macmillan, 1928.)

while at the same time he is unable to see the person who is observing him, thus eliminating distractions to normal behavior (see Fig. 2). In addition to this, the use of the moving-picture camera, as a means of

recording accurately every movement made by the baby, together with stenographic notes of the observations, taken simultaneously by several observers, have added to the scientific accuracy of the technique.

Bühler (1930), in Vienna, has used the same method of continuous systematic observation of babies under conditions normal to everyday life. Barker (1930) and Loomis (1931) have worked out a technique for the study of reactions of nursery-school children to objects and to people. To date, this method has been limited in its use to the study of the younger age groups.

With the control of the environmental conditions as well as of the stimuli applied to the child, plus careful observations made simultaneously by several trained observers and recorded immediately in shorthand notes, there is an accuracy to this method which is not found in the more or less haphazard recording of observations on the part of those who made the early biographical studies. The impersonal scientific attitude of the observers contrasts markedly with the personal and often prejudiced attitude of the biographers.

The criticism most often raised against this method is that it places the child in an artificial environment, and consequently his behavior cannot be regarded as natural. Recently, however, attempts have been made to overcome the artificiality of the laboratory environment by reproducing as nearly as possible the furnishings and atmosphere of the home nursery. Gesell was the first to demonstrate that this could be done. The laboratory at Yale used for child study so closely resembles the home environment in appearance that a young child at once feels at home when he sees the familiar furnishings of chairs, cribs, and toys (see Fig. 2).

Conclusion.—With the elimination or minimizing of the four major obstacles that have stood in the way of scientific studies of children, namely, the attitude of society toward the child, the difficulty of securing children for scientific studies, the lack of scientists who could handle children successfully, and the lack of methods suited to the study of the child, the psychologist now finds himself in a position in which it is possible for him to study children with as great confidence in the accuracy of his results as he has when he studies adult subjects. Because of the popular interest in obtaining information about child development, as well as the practical need for this information in the fields of education and medicine, the psychologist has had strong motivation to pursue his studies of the child from every possible angle. The result has been a tremendous increase in information about child development during the last decade.

CHAPTER II

PRINCIPLES OF DEVELOPMENT

From the moment of conception until the age of maturity, the individual develops into the physical and mental structure that characterizes the adult. Development is a continuous process which starts before birth; and we should regard birth therefore as merely an incident in a long succession of changes, not the beginning. This long, slow process of developing must be studied carefully at its principal stages, if one is to have an adequate understanding of the child.

Development.—Development refers to the progressive series of changes of an orderly, coherent type toward the goal of maturity. The term “progressive” signifies that the changes are directional, leading forward rather than backward. The terms “orderly” and “coherent” suggest that development is not of a haphazard, casual type, but rather that there is a definite relationship between each stage and the next in the developmental sequence.

Development is a type of change which results in new characteristics and abilities on the part of the child. It consists of a transition from lower to higher ages of activity or function. These changes are far greater in the early years of life than later on, the greatest of all occurring in the prenatal period and being governed by essentially the same principles that occur in the development after birth.

Practical Significance.—There are three important advantages to be derived from knowing what is the normal development of the child. (1) It enables one to know what to expect of the child at every age and to know in a general way at what age different forms of behavior will emerge into more mature forms. (2) Because the pattern of development is approximately the same for all children, it is possible to judge each child in terms of the norms for that age. (3) Since all development requires guidance, knowledge of the normal development of the child enables those in charge of the child to guide his development into desired channels.

TYPES OF CHANGE IN DEVELOPMENT

Development consists of changes but not all changes are of the same sort. Nor do they influence the process of growing up in the same way. The changes which occur in development may be divided roughly into four major classes, which are as follows:

1. Changes in Size.—Changes of this type are especially obvious in physical growth, though they can be observed readily in mental growth if a standard test of intelligence is used. Each year, as the child grows older, his height, weight, and circumference measurements increase unless some abnormal condition interferes with normal growth. Likewise, the different internal organs and structures, such as the heart, lungs, intestines, and stomach grow larger to take care of the increasing needs of the body. Mental development shows similar changes in magnitude. The child's vocabulary increases annually, his ability to reason, remember, perceive, and use creative imagination, all normally expand during the growth years.

2. Changes in Proportion.—As may be seen from the accompanying diagram (Fig. 3), physical development is not limited to changes in size. The child is not merely a "miniature adult," as was formerly believed, but his whole body shows proportions different from those of the adult. This is especially evident when the child's body is magnified to adult size, as may be seen in Fig. 3. It is not until the child reaches puberty, around the age of thirteen years, that the proportions begin to approximate those of the adult body.

The changes in physical proportions which occur during the developmental years are well illustrated by the following growth rate table:

TABLE I.—CHANGES IN PHYSICAL PROPORTIONS

Height of head	doubles
Length of body	trebles
Length of upper limbs	quadruples
Weight of the brain	quadruples
Length of lower limbs	quintuples
Weight of heart	increases thirteenfold
Weight of lungs	increases twentyfold
Weight proportion of bone, fat, and skin	does not change
Weight proportion of muscles	increases twofold
Weight proportion of nervous system	decreases to one-eighth of infantile proportion

Source: HOLLINGWORTH, H. L. *Mental growth and decline*. New York: Appleton-Century, 1928, p. 10. Quoted by permission.

This change in body proportions, which is so obvious from the table given above, is due to the different rates of development for the different parts of the body. Since each of the different parts of the body has its own individual growth rate and since there is no uniform age at which each part reaches its mature stage of development, the general effect is to produce a physical structure which, from the point of view of proportions, differs markedly from that of the mature adult.

Changes in proportion are also apparent in mental development. This may be illustrated by two specific examples: changes in imagination and changes in interests. In early childhood, the imagination is pre-

dominantly fantastic, with little reference to reality. Gradually as the child grows older, the fantastic element gives way to a very realistic, matter-of-fact, common-sense sort of imagination, so harnessed and controlled as to be useful in planning and in all forms of creative work. A change also occurs in the interests of the child. At first, his interests

are concentrated on himself and his toys. Gradually, his interest shifts to other children of his acquaintance and the activities of the neighborhood gang. Then in adolescence, the interests are focused on members of the opposite sex, clothes, and all that is closely bound up with courtship.

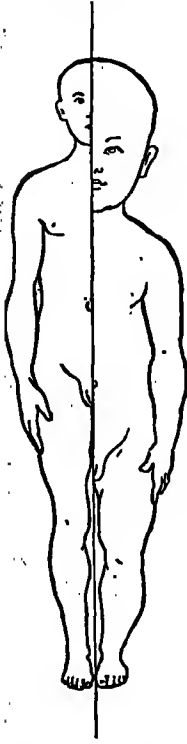


FIG. 3.—The bodily proportions of the newborn infant and the adult. (After Stratz, from K. Bühler, *Mental development of the child*. Harcourt, Brace, 1930.)

3. Disappearance of Old Features.—A third important type of change which occurs in the development of the individual consists of the disappearance of certain features. Among the physical features, the most important ones to disappear gradually as the child grows older are the thymus gland, often called the "gland of babyhood," located in the chest; the pineal gland at the base of the brain; the Babinski and Darwinian reflexes; "baby hair"; and the first set of teeth, the "baby teeth." Nature takes care of this matter, and eliminates the different physical traits which have lost their usefulness. Among the mental traits which gradually outlive their usefulness and then disappear are babbling and all other forms of baby speech; childish impulses to act before thinking; babyish forms of locomotion, such as creeping and crawling; and sensory keenness, especially in regard to taste and smell.

Mental attitudes and habits of action, on the other hand, are retained because it is easier to retain them than to eliminate them, or because of some sentimental attachment. Unfortunately, many parents encourage this without realizing that they are retarding the child's development and making it difficult or even impossible for him to advance to a more mature level of development. Old habits are often clung to voluntarily by the child, especially in the case of childish emotional habits, because of the pleasure they give or the usefulness they serve.

4. Acquisition of New Features.—In addition to the discarding of features which have outlived their usefulness, a fourth type of developmental change is to be observed in the acquisition of new physical and mental features. Some of these are acquired through learning, but many

of them result from the maturing or unfolding of native traits not fully developed at birth.

Among the physical features, the most important ones which are acquired during the growth period are first and second teeth and primary and secondary sex characteristics, the latter making their appearance during the early months of adolescence. Among the mental traits acquired by the individual are curiosity, especially about sex matters, the sex urge, knowledge, moral standards, religious beliefs, different forms of language, and all types of neurotic tendencies.

Significance of Changes.—From the discussion given above of the four important forms of change which occur in the development of the child, it is apparent that the child is not a small-scale adult but is a unique thing with distinct characteristics of its own. The process of development, which will carry him through babyhood, childhood, adolescence, and finally into maturity, is a complex one, but it is guided and controlled by definite natural laws. The changes occur gradually and are often not apparent when they occur.

With physiological changes come changes in attitudes as well as in behavior. The loss of baby teeth gives the young child a feeling of importance, which motivates him to assert himself and resist adult authority. Increase in height has much the same effect, for as the child approaches adult stature, he no longer has to look up to adults. This, he almost seems to reason, puts him on a par with them in other respects, and he demands the privileges that accompany maturity. During adolescence, skin eruptions lead to marked self-consciousness, and this, in turn, makes the boy or girl self-conscious, shy, and retiring in social relationships. These are but a few examples of how complex and interacting are the many lines along which the child develops.

METHODS OF STUDYING DEVELOPMENT

Measurement of Large Groups.—Two methods have been used to trace the development of the child. The *first* consists of measuring different large groups of children at different age levels, to get norms or standards of development for those ages. This technique has been used very widely for studies of physical growth, such as height and weight, and for studies of general intelligence. It is a method that is relatively easy to apply, and it does not necessitate a long period of time to complete the study, as is true when one group is restudied year after year.

The serious limitation of this approach to the study of development is in the ability to get comparable groups, or fair samplings of the population at different ages. Are the children selected for a five-year-old group, for example, nearly enough like those selected for the six-year group so that the measurements of the six-year group would be similar

to those that might be made on the five-year group one year hence, and therefore could justifiably be substituted for them? Or, putting it in another way, will a given group of five-year-olds show, with retests year after year, the same physical and mental development that one finds in a number of different groups of different ages, taken to represent the "norms" for those ages? As no one has ever subjected this question to scientific investigation, adequate in scope to affirm or disprove it, the method is open to criticism as an approach to the investigation of development.

If it is to be used at all, it must involve very large and very widely selected groups for each age level. No less than several thousand children at each age level should be used, and the sampling should not be taken from one community, or a part of a community, but from a cross section of a state or a nation. Only when large, random samplings are used can one have confidence in the results obtained from this method.

Reexaminations.—The *second* method of investigating development consists of the reexamination of the same individuals, at certain intervals, day after day, month after month, year after year. This is, of course, a more arduous task and requires far more time than the cross-section technique just described. But because it involves the study of the development of the same individuals, rather than of different ones at each age level, there is justification in believing that it gives a more accurate picture of the typical child's development. And because preliminary studies made by this method have shown that the course of development for normal children is approximately the same for all, it is not essential that such very large groups be used. This offsets some of the complications that arise in the practical application of this method, especially that of getting all of the same children for reexamination year after year.

In the study of development of general intelligence, Terman and others have used the reexamination technique to see what changes occur in the child's intelligence year after year. Also, in his study of 1,000 boys and girls of "genius" intelligence, Terman (1926) traced their physical, intellectual, and social development from kindergarten to college and, in some cases, after they had established themselves in business or professions. Gesell (1930) at the Yale Psycho-Clinic has reexamined over 100 babies month after month. From data thus obtained, he has established "developmental norms" of behavior for the different ages. In studies of prehension of a small sugar pellet, for example, he found that successive stages of grasping came at approximately the same ages and in the same order in different children, thus giving a picture of patterned behavior of a consistent type.

Shirley (1931a) followed, through repeated examinations at frequent intervals over a two-year period, the development of 25 babies. The pur-

pose of doing this was to see if certain traits were transitory or constant over this time and to trace the course of development. She then compared the results obtained with baby biographies and with babies studied by Bühler, Burnside, Gesell, and Jones. She found that motor development in little children followed a pattern in which five "major orders" were apparent. Burnside (1927) used a similar technique in the study of walking, and Halverson (1931) in the study of prehension. The results of these studies will be presented in the chapter on Motor Development.

RATES OF DEVELOPMENT

Variations in Rate.—Development, whether "physical" or "mental," is not a uniform process in which equal amounts of growth take place annually each successive year. For one thing, it is extremely rapid during the prenatal period, when the individual grows from a microscopically small germ cell to an infant weighing approximately 8 pounds and about 20 inches in length. At birth, the baby is three-tenths of his height at the age of eighteen. In other words, in nine months his growth is approximately one-third of what it will be eighteen years hence.

This accelerated rapidity of development continues throughout babyhood, to the age of three years, except for the first two weeks immediately following birth, when a "plateau" stage occurs during which the newborn infant is becoming accustomed to his new environment. To realize how rapidly the changes have occurred, all one has to do is to compare a three-year-old with a newborn infant. During this period, one can almost see the baby grow. Moreover, the physical development is closely paralleled by an equally rapid mental development.

From three to six, the growth rate continues to be rapid, though not so rapid as in the preceding three years. From birth to five years, growth equals that of the years five to fifteen. But, toward the age of six, growth begins to slacken, and from then until just before adolescence, the rate of development is somewhat retarded. Then, in preadolescence and early adolescence, at approximately twelve to fourteen years, the rate of development is once more accelerated, only to slow down again in two or three years as the individual approaches the level of maturity.

Or, to compare six-year periods: the rate of development during the first six years is proportionally three times as great as during the next two six-year periods. In general, the third of the six-year periods, which begins during the adolescent years, is the slowest from the point of view of rate of development.

Factors Influencing Rate of Development.—While it is true that the limit of the child's physical and mental development is determined by the structure of the germ cells from which he has developed, nevertheless, the activity of the child, plus such environmental factors as food, exer-

cise, and education, influence the rate and extent of the changes as the child approaches the limit of his development. Medical studies have shown that the nutrition in babyhood is influential not only in growth changes but also in the final degree of development attained.

The rate of development of the child can be modified by speeding up the growth process, by reducing the rate of development, or by altering the form or sequence of the pattern through manipulation of the factors involved in the growth process. The use of gland treatment will illustrate this fact. Gonad treatment will speed up the puberty changes of adolescence; while deficiency of thyroxin that is responsible for delayed physical and mental growth can be compensated for by introducing thyroxin into the body, thus accelerating the growth to the point that it closely approximates the norm.

CAUSES OF DEVELOPMENT

Maturation.—Development of the physical and mental traits of the individual is partly the result of an intrinsic maturing of those traits, and partly the result of exercise and experience on the individual's part. By maturation is meant the development or unfolding of traits potentially present in the individual, because of his hereditary endowment from his parents and other ancestors. While not directly dependent upon the child's experiences, it is stimulated and influenced to some degree by the different environmental factors with which he comes in contact.

The appearance of a trait through maturation is frequently characterized by a striking suddenness. During the pubertal changes preceding adolescence in the male, hair appears on the face and the voice changes from high to low pitch in the short span of a few months. While these physical changes are taking place, there is a sudden change in attitude toward members of the opposite sex, which results in a "boy-crazy" or "girl-crazy" interest as opposed to the aversion to members of the opposite sex which formerly existed. Or, again, in the development of the ability to walk, one of the most characteristic aspects is the sudden appearance of each successive stage, often after one had believed the child would be far behind the usual age for attaining this particular skill.

Learning.—Development likewise is brought about partly by a second cause, which results from the activities of the child himself. This type of development is generally referred to as "learning" because it requires exercise to bring about changes in the physical structure and behavior of the individual. Not all learning is of the same type. It may result from practice or the mere repetition of an act which, in time, brings about a change in the individual's behavior. Or, it may come from training, which is a selective, directed, and purposive type of activity. Whether

it be caused by practice or training, the changes which take place in the child's behavior are due to the activities of the child.

Interrelation of Maturation and Learning.—Maturing and learning are not separate and distinct causes of development, as the discussion above may suggest. As a matter of fact, they are closely interwoven, and one influences or retards the other. Without effort, traits potentially present will not develop to their maximum, while with effort, properly directed and applied at the time when those traits should normally begin to mature, the development will be more nearly complete. If, on the other hand, a trait is limited in its potentialities for development, no amount of effort or exercise on the individual's part will be adequate to bring it up to a desired standard.

Maturation provides the raw material for learning and determines to a large extent the more general patterns and sequences of the individual's behavior. As the body structure changes and matures, behavior dependent upon it appears. It is an error to suppose that maturation is limited to the prenatal and learning to the postnatal periods of the individual's life, for some learning takes place before birth just as some maturation occurs after birth. It is true, however, that development during the prenatal period is due mostly to maturation and is very little dependent upon exercise.

EXPERIMENTAL STUDIES OF MATURATION

Many experimental investigations of the role played by maturation in the development of the individual have been made. The main purpose has been to discover the relative importance of maturation as compared with learning or, expressed in other terms, how much of the child's development will occur of its own accord, and how much will have to come about as a result of the child's experiences. This is far from an easy problem to solve, and it has been investigated from different angles, with the use of different methods. The most important of the methods are the *method of isolation*, the *method of co-twin control*, the *matched group method*, and the *genetic study of large groups*, to determine if a pattern of development, similar in outstanding characteristics, is present.

1. The Method of Isolation.—The method of isolation for the study of maturation has been used much on animals. The fundamental principle of this technique consists of isolating the young individual from older members of the same species, to see if certain traits of behavior, characteristic of that species, will appear without an opportunity for learning on the animal's part. Studies of human babies, using the isolation technique, have been very infrequent because of the practical difficulty of getting babies for such a study, and because of the objection raised by parents and others that it is unfair to the child.

Recently, Dennis and Dennis (1938) used this technique in the study of a pair of female twins from the end of the first to the end of the fourteenth month of life. The babies were kept in a special experimental room with full experimental control, to enable the experimenters to study the effect of restricted practice on their reaching, sitting, and standing. To eliminate practice in reaching, the babies' hands were placed under a bib or napkin when eating, or under the tightly tucked bedclothes, in cool weather. No bedclothes were used in warm weather. No toys were given to the babies until they were eleven months old. Similar restrictions were placed on sitting or standing, by keeping the babies on their backs in their cribs. These restrictions were planned to eliminate opportunities for the babies to learn and thus to show how much of their development was due to maturation alone. The results of this study were then compared with data from baby biographies compiled by Dennis (1936) and from material obtained by Shirley (1931a) in a study of the development of 25 babies brought up under normal conditions.

Dennis found little, if any, retardation in the development of the three activities studied during the first nine months of life. The twins showed behavior very similar to that of babies brought up under normal conditions. After nine months, however, the effects of restriction were noticeable. As soon as the babies were given an opportunity to learn, the abilities appeared with relative promptness. These results indicate, Dennis contended, that reaching, sitting, and standing would not develop without an opportunity for practice and thus are not due to maturation alone. At the same time, the fact that practice brought about quick learning indicates that maturation has provided the necessary foundation for learning.

In a later study, Dennis and Dennis (1938) were interested to see if the child's behavior would follow its normal course in the absence of such social stimuli as fondling, adult interest, encouragement and discouragement in new actions, and attempts at teaching. The babies' physical wants were cared for, but each received a minimum of handling, reward, and punishment. When their behavior was compared with that of children reared under the usual human environmental situations, as shown by 50 baby biographies, Dennis found that the twins had developed all the typical responses of the first year, such as laughter, timidity, and vocal greeting. This led Dennis to conclude that these activities develop not instinctively but as a result of minimum stimulation from adults.

2. Method of Co-twin Control.—The second method of studying the relative importance of maturation and learning in the child's development is the method of co-twin control, used first by Gesell and Thompson (1929). A pair of identical girl twins served as experimental subjects.

for their study. Twin *T* or Twin Trained was given daily training in climbing steps and handling cubes for six weeks, from 46 to 52 weeks of age. The Control Twin, Twin *C*, was given no training in these two types of behavior during this period. At the age of 53 weeks, however, Twin *C* was given two weeks of training in step-climbing. Gesell and Thompson found the climbing performance of Twin *C* at 55 weeks of age far superior to that of Twin *T* at 52 weeks, even though Twin *T* had had three times as much training as Twin *C*. This superiority, they explained, was due to the advantage of maturity.

Twin *C* received no training in cube behavior as contrasted with the six weeks of training given to Twin *T*, but the pattern of behavior was very similar for both. The manner of taking hold of a pellet was shown to be almost identical in photographs of the details of position of hand, posture, and other parts of the body. In fact, in 612 items of behavior observed, 513 showed identical or nearly identical correspondence, while only 99 showed minor disparity.

Similar results were found for *language*. Strayer (1930), using the Gesell and Thompson twins as subjects, gave Twin *T* training in language from 84 to 88 weeks of age. Twin *C* had no training until she was 89 weeks old and was then given training until she was 92 weeks old. During the time, Twin *T* had no training. Strayer found that Twin *C*'s level of accomplishment was higher after 28 days of training than Twin *T*'s after 35 days, but Twin *C* did not catch up to Twin *T*'s accomplishment at the end of the experiment. Delayed training proved to be more effective than early training, because of the groundwork established by the maturing that went on in the interval.

Hilgard (1932), in a follow-up study using the same twins, investigated the relative effects of early and delayed practice in *memory tests*, as digit-memory, object-memory, and in more complex *motor tests*, as ring-toss or errors on walking boards. Twin *T* was given three practices a week for eight weeks while Twin *C*'s practice was delayed three months. Delayed practice resulted in a more rapid gain on most tests for Twin *C*, but, three and six months after practice, the performances of both twins on all tests proved to be similar. Jones (1930a) studied identical twins in situations involving the handling of blocks. The twin that received training did not prove to be superior to the twin whose contact with blocks began later.

In an attempt to determine the relative importance of maturation and training on phylogenetic functions, or functions common to the race, and ontogenetic functions, which are specific to the individual, McGraw (35) used a pair of boy twins, Jimmy and Johnny, as her experimental subjects. Johnny was subjected to intensive daily training in a variety of motor skills, which included *phylogenetic* functions, as crawling, creep-

ing, hanging from a rod, sitting and walking, and *ontogenetic* activities, as jumping from pedestals, roller skating, swimming, scaling inclines, arranging boxes to reach a toy, and tricycle riding. Figure 4 illustrates the development of swimming activities. The ontogenetic functions were trained as soon as an appropriate state of development had been attained in the phylogenetic functions. For example, crawling skill was used as the starting point for swimming lessons and walking as a clue

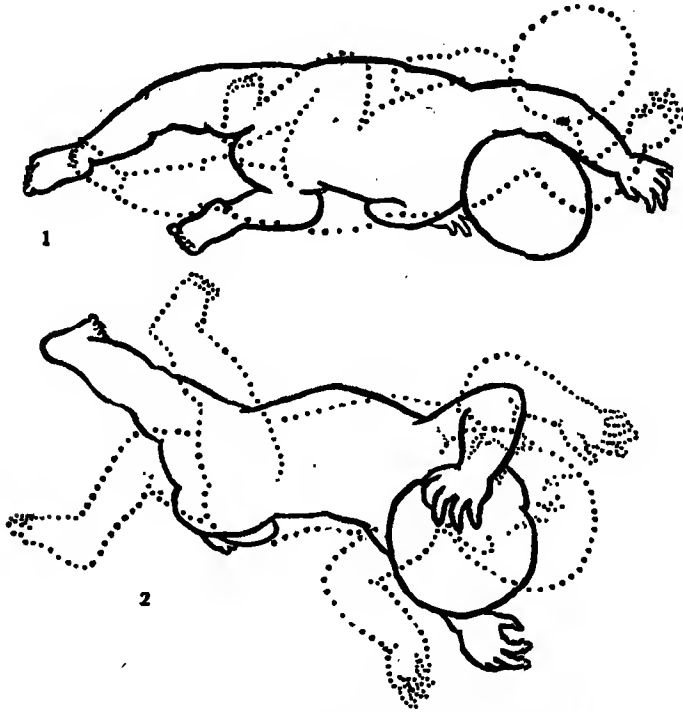


FIG. 4.—Swimming activities. (From M. B. McGraw, *Growth: a study of Johnny and Jimmy*. Appleton-Century, 1935.)

for the beginning of training in roller skating. During Johnny's training periods, Jimmy was isolated in a crib behind a screen.

The results of this experiment showed that training in phylogenetic functions gave Johnny little or no advantage over Jimmy. The two showed the same activities at the same time, with Jimmy sometimes ahead of Johnny. In the ontogenetic activities, on the other hand, Johnny was far ahead of Jimmy. Even though Jimmy was given periods of practice after Johnny had acquired considerable skill in the different activities, Jimmy learned only some of the skills and refused to try the others.

Criticisms of Method.—While the co-twin control method is a good one from the point of view of scientific accuracy and control, there are practical obstacles in the way of applying it, especially after the early years of life. It would be almost impossible to carry out a series of tests on a large number of identical twins because of the difficulty of getting free rein over these twins for experimental studies. Again, because Twin C may be retarded in development by eliminating training, even though it be only along certain lines, it would be difficult to use this method after the early years of babyhood. For that reason, the method of co-twin control may be regarded as practical only during the early years of life and, even then, must be limited to a small number of subjects.

3. The Matched-group Method.—Because of the practical difficulties in using the method of co-twin control to study maturation, a third method, the *matched-group method*, has been used. This is an offshoot of the co-twin control method in that it uses two similar groups, matched in traits definitely related to the behavior studied, instead of two matched individuals, as used in the case of identical twins. Like the method of co-twin control, this method studies the relative influence of maturation and learning through the training of one group, while the second group is allowed to develop of its own accord without any opportunity to learn.

Group studies of children have been numerous. Hilgard (1932) carried out an experiment with two groups of nursery-school children, equated for chronological age, mental age, sex, and initial abilities in tests of buttoning, climbing, and cutting with scissors. The practice group was given 12 weeks of practice while the control group was given only four days of intensive practice at the end of the 12-week period. This proved to be sufficient to bring the scores of the control group up to those of the practice group. It showed that factors other than specific training, such as maturation and practice in related skills, contributed to these three skills. This is well illustrated in Fig. 5, showing the learning curves for buttoning. In an experiment involving ladder-climbing, Hilgard (1933) used two equated groups of two-year-olds. The trained group, after 12 weeks of intensive training, proved to be far superior to the control group but the control group needed only one week of training to equalize the trained group.

Hicks (1930, 1931) studied the effect of practice on young children's skill in hitting a moving target. The children in the practice group did not score significantly higher than those in the control group who were given only initial and final tests. This, Hicks suggested, indicates that improvement in skill is not the direct result of specific practice but comes from such factors as structural maturation and general practice. Jersild (1932) studied the effect of special training in motor, mental, and musical performances in the case of children, two to eleven years old, to see if

special training would raise a child's capacity beyond the level achieved in the normal process of growth. The children who were given practice, he found, showed some advantage over the control group at the end of the training period which covered several weeks. But they maintained this lead in only one experiment. Thus, the children who had training gained only a temporary advantage over the others.

To see if intensive practice preceding full maturity will stimulate and increase the rate of growth of certain capacities, Gates and Taylor (1926) used memory for oral digits and speed of tapping tests on children

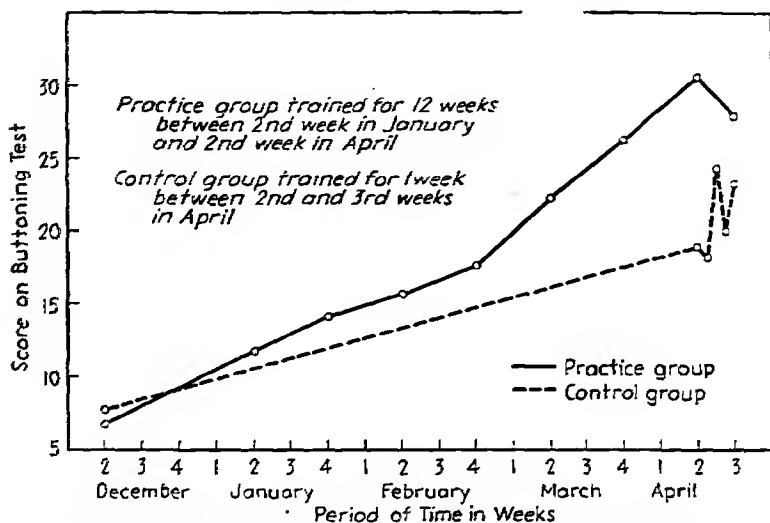


FIG. 5.—Learning curves for practice and control groups. (From J. R. Hilgard, *Learning and maturation in preschool children*. *J. genet. Psychol.*, 1932, 41.)

from four to six years old. In 78 days of practice in memory for digits, the practice group showed three times as great improvement as the control group. But, retesting the groups 4½ months later showed that the gain of the practice group had been lost, and the two groups were nearly equal again. This led Gates and Taylor to conclude that maturational processes are not perceptibly affected by special training.

4. The Genetic Study of Large Groups.—The fourth method that has been used to study the relative importance of maturation and learning in the development of the child consists of a genetic study of large groups of children, to see if a pattern of development appears, regardless of differences in environment. If children from different environments who have been subjected to different opportunities for learning, show behavior that is similar in its fundamentals, even though it may differ in specific details, it is apparent that this behavior has not been learned

Thus, it is argued, it must be due to the natural unfolding of traits potentially present, or to maturation.

Shirley (1931a) studied 25 babies from birth to two years of age by means of repeated tests and observations. She found that certain forms of behavior appeared in a fairly definite order that was similar for all, even in the case of the bright and dull. For example, the children showed the ability to walk when led before they could get to their feet alone, and to climb up stairs before they could climb down. Less than 5 per cent of the children studied reversed the order of the group.

How marked the developmental pattern was is shown by the fact that the correlation of each child's order of development, in the case of 12 items of motor development, with the order of the average child was .93 or above. This indicated that the children in her group adhered closely to pattern and suggested that the behavior studied was not the result of training but of maturation. Gesell's (1930) study of premature, full-term, and postmature infants revealed a constant pattern of behavior for all. A baby born one month prematurely, for example, resembled a three-month-old baby when he was three months old.

Implications.—The general implication from the studies summarized above is that the effectiveness of learning depends upon maturity. From these studies, we have the beginnings of an inventory of normal development which suggests at approximately what age to expect behavior of different types, and hence when to begin training. Phylogenetic functions will develop without specific practice. Even interferences and restraints from the environment will retard the functions only slightly. Given an opportunity to do so, the baby will exercise spontaneously in ways that will improve his development. In the case of ontogenetic functions, on the other hand, systematic training is needed. This is most advantageous if given when the basic motor coordinations are already developed. Even in the case of phylogenetic functions, none of which unfolds at a high level of development, practice and training, either spontaneous or forced, causes them to develop to a higher level.

The reader hardly needs it pointed out that the significance of knowing the role played by maturity is not academic alone, but it has a practical bearing on the education of the child. It suggests at what age training should begin and in what sequence it should occur. If the child is not old enough or mature enough to profit by the teaching, it has little value for him and can be regarded as wasted time and effort on the teacher's part. In addition to that, the premature forcing of the child to learn results in resistant, negativistic behavior which militates against successful learning. If, on the other hand, the necessary maturation has been attained, time and effort are saved in teaching, and the attitude of the child toward learning is more favorable.

CHARACTERISTICS OF DEVELOPMENT

There are certain features which are characteristic of human development and which influence greatly the form it takes. It is impossible to evaluate these fairly in every respect, so as to list them in the order of their importance. Nevertheless, an attempt will be made to list first those which seem to be most influential. The characteristics of development are as follows:

1. Development Follows a Pattern.—Every species, whether animal or human, follows a pattern of development peculiar to that species. The rate and limit of development are similar for all members of the species. In the case of the human, development is not of a haphazard, unorganized type. Rather, it occurs in an orderly, patterned fashion. Even the prenatal development is like that of other fetuses, in that there is a genetic sequence, with certain traits appearing at each month. The same is true of the postnatal development. Each stage is the outcome of the one preceding it, and the prerequisite of the one following it. The baby, for example, cuts his molars before his incisors, can stand before he walks, and can draw a circle before he can draw a square.

Cephalocaudal Sequence.—In both prenatal and postnatal life, development follows the *cephalocaudal sequence*, which means that control of the body, as well as improvements in the structure itself, develops first in the head and progresses later to regions farthest from the head. Skin sensitivity, for example, comes in the uppermost part of the body before it appears in the lower. Sherman and Sherman (1925) stimulated newborn infants with pinpricks applied with equal intensity to the cheeks, anterior surface of the thighs, and lateral surface of the calves. All infants studied reacted to stimulation of the face. Those above 41 hours old needed only one stimulus. To the leg stimulation, only one out of four infants responded to ten stimuli at the age of one to six hours. All infants over 76 hours old responded to one stimulus. This, they explained, was due to differences in the threshold of sensitivity between the face and legs.

The cephalocaudal sequence may be seen in motor functions also. When the baby is placed in a prone position, he can lift his head by his neck before he can do so by lifting his chest, or before he can sit up. He can control the muscles of the trunk before those of the arms and legs, and those of the arms and legs before the muscles of the feet and hands.

The general pattern of development is not altered by the speed of the development. All children pass through the same fundamental forms, at approximately the same times. Gesell's (1930) studies of premature and postmature infants showed that the growth course follows a genetic sequence, irrespective of irregularity of birth. Retesting of an infant

born two months prematurely showed growth curves similar to those of full-term infants. The same was found to be true of postmature infants. This led Gesell to conclude that the tempo of development is determined by inherent maturational factors.

Melcher (1937) tested prematurely born babies with the Bühler-Hetzer infant scale and found that they lagged behind full-term babies up to five months of age. After that, they conformed to the average. Similarly, children who deviate markedly from the normal in intelligence, as the feeble-minded and genius, follow the same pattern of growth as the normal child, only at different rates. Any marked variation from the sequential pattern is relatively infrequent.

Specific Phases of Development.—Not only does total development follow a pattern but specific phases of development, such as motor, social, and play, follow a pattern also. This will be shown time after time in later chapters of the book. One illustration, the development of prehension, will suffice for the present. Halverson (1931), in a study of the baby's method of picking up a cube, found that the method changed with increased age, but that the changes followed a pattern in which appeared first a backhand sweep, then a circuitous approach, and finally a direct approach. In the grasping movement, he differentiated 10 types of grasp, which appeared in a genetic series. In a similar study, Castner (1932) found three types of visual regard for a pellet, transient, brief, and prolonged, which occurred at definite age levels, and in the order given above. Grasping, Castner found, followed a pattern in which the earliest form was whole-hand closure, followed by palmar prehension, scissors closure, and finally pincer type, comparable to that used by adults.

2. Development Proceeds from General to Specific Responses.—In all phases of development, whether motor or mental, the child's responses are of a general sort before they become specific. In both prenatal and postnatal development, general activity precedes specific activity. At no time and under no conditions is the reverse the case. This is apparent first in muscular responses. The newborn infant moves his whole body at one time, instead of moving any one part of it. The baby waves his arms in general, random movements before he is capable of so specific a response as reaching. Likewise, his legs are used for random kicking before he can coordinate the leg muscles well enough to crawl, creep, or walk.

The baby can see large objects before he can see small ones, because his eye movements are not coordinated enough at first to focus on small objects. The same pattern is seen in handedness. When the baby first reaches for an object, he not only uses both hands but his legs and whole body are thrown into the response simultaneously. Around the sixth

month, the reaching response is restricted to the two hands, and later, at approximately one year of age, to one hand. In learning a new task, such as dressing, the whole body wiggles and is thrown into activity. With improvement in this skill, the activity is limited to the hands. In other aspects of development, the same sequence is seen. The baby produces general, babbling sounds before he can say words. In building a vocabulary, he learns general words before specific. For example, he uses "toy" for all playthings before he learns to call each toy by its name. All dogs are "doggie" at first and then are designated as "Rowdy," "Inky," or "Scottie." Concept formation follows the same pattern. The baby first distinguishes living from inanimate objects, then human beings from animals, then different types of human beings, as white, colored, American, or Chinese. In emotional behavior, the baby first responds to strange or unusual objects with a general fear which is the same in all situations. Later, his fears become more specific and are characterized by different types of behavior in different situations.

3. Development Is Continuous.—From a superficial study of the growth of one feature, such as height, it may seem that the individual grows by "fits and starts" rather than at a continuous rate. Likewise, the use of such terms as "gang age" and "adolescence" suggests that there are definite periods when growth takes place and implies that at other times growth has ceased. This, however, is not the case. On the contrary, growth continues from the moment of conception until the individual reaches maturity. It takes place at a slow, regular pace rather than by leaps and bounds. The development of both physical and mental traits continues gradually until these traits reach their maximum growth during the period of late adolescence. The use of certain terms to designate growth stages has been accepted to stress the fact that a particular type of growth is occurring at that particular time.

No traits, whether physical or mental, develop suddenly. On the contrary, they are all the product of a growth which started before birth. Several examples will illustrate this point. In physical growth, the appearance of the first teeth, during the first year of life, suggests that they developed suddenly. This, however, is not true. Teeth begin to develop as early as the fifth fetal month, though they do not cut through the gums until about five months after birth. Speech does not come overnight, but is gradually evolved from the cries and other sounds made by the baby at birth.

Studies of physical and mental growth indicate that growth is continuous throughout the developmental years. While the rate is not always the same, the most rapid growth occurring at the beginning and the slowest growth at the end of the developmental years, nevertheless, under normal conditions, there are no breaks until growth is completed.

Any break which may occur in the continuity of the child's development is due to illness, starvation, environmental factors, or some abnormal condition in the child's life. Physical development is more affected by these unusual conditions than is mental development. During a period when growth appears to be very slow, there oftentimes is internal development taking place which paves the way for more rapid development in the next period.

4. Individual Differences in Rate of Development Remain Constant.

The common belief that the baby who is physically or mentally below average will "catch up" to the average has not been substantiated by scientific evidence. On the contrary, there is plenty of evidence to show that the rate of growth is consistent and that those who developed rapidly at first will continue to do so, while those whose development was slow will continue to develop slowly.

Curves of height have shown that children who are tall at one age are tall at other ages, while those who are short remain short. Baldwin (1922) found a correlation of $.825 \pm .036$ for boys' height between six and twelve years, and $.807 \pm .027$ for girls. Growth curves for mental age for bright, average, and dull children have shown the same to be true for mental as for physical development. Gesell's (1928) study of accelerated mental growth in babies by the reexamination technique showed that babies had consistent acceleration in mental growth from two months on. Terman's (1926) study of men of genius showed them to be precocious in development during childhood. Children who are mentally deficient do not, except in unusual cases, "catch up" to the normal child. What is more likely to happen is that they will become more and more retarded as they grow older.

The value of knowing that development progresses at the individual rate at which it started lies in the fact that it enables one to predict at an early age, with relative accuracy, what the final state of development will be. The only time when this is not true is when growth has been retarded by some condition which may be remedied, should treatment be given in time. In cases of glandular deficiency, undernourishment, or poisoning due to diseased tonsils and adenoids, physical and mental development are somewhat retarded. When these handicaps are removed, development is then resumed at its normal rate.

5. Development Occurs at Different Rates for Different Parts of the Body.—Not all parts of the body grow at the same rate, nor do all aspects of mental growth proceed equally. At birth, the different parts of the body vary in relation to one another. If the body is to attain adult proportions, inequalities in growth must take place. The different phases of mental and physical growth occur at their own individual rates and reach maturity at different times. Thus, the pattern of

relative size of the organs of the body changes from time to time. The brain attains its mature size around the age of six to eight years but gains much in organization after that. The feet, hands, and nose reach their maximum development early in the adolescent years. This accounts, in part, for the awkwardness, clumsiness, and self-consciousness characteristic of these years. The heart, liver, and digestive system grow much during adolescence.

While too few studies of the rate of mental growth have been made to date to draw any definite conclusions, nevertheless, there is evidence to suggest that different phases of mental growth likewise proceed at different rates. Creative imagination develops rapidly in childhood and seems to reach its peak during youth. Reasoning, on the other hand, proceeds at a relatively slow rate of development. Rote memory and memory for concrete objects and facts develop more quickly than memory for abstract, theoretical material. General intelligence, for the average individual, reaches its peak around the age of sixteen years.

6. Most Traits Are Correlated in Development.—The popular assumption that compensation is a general rule in the development of a child is not borne out by experimental studies. It is not true that the child who is above average in one trait will be below in others, and vice versa, as a means of equalizing his capacities. As a matter of fact, just the opposite is true. The child whose intellectual development is above average is generally above average in health, size, sociability, and special aptitudes.

The child whose intellectual development, on the other hand, is below average, does not compensate for this by having very superior health, highly developed special aptitudes, great sociability, or superior physical structure. Mental defectives tend to be smaller in stature than the normal child. Idiots and imbeciles are the smallest of the feeble-minded group. Similarly, high-grade intelligence has been found to correlate highly with early sexual maturing, and low-grade intelligence with late sexual maturing, though there are climatic, racial, and other determinants that have to be kept in mind.

7. Development Is Predictable.—Just because the rate of development for each child is fairly constant, the immensely important consequence is that it is possible for us to predict at an early age the range within which the mature development of the child is likely to fall. This has proved to be of outstanding value in planning the education of the child and in helping him to train for the type of work he is best fitted to carry out. It has also proved to be of great value in the choosing of babies for adoption.

Gesell's (1928) reexamination of nearly 100 babies during the first two years of life showed that, in 80 per cent of the cases, the develop-

mental rating made on the first examination corresponded to the final clinical estimate based on the total series of examinations. In 23 cases rated as mentally defective, Gesell (1930) found that in all but one of the cases, the final developmental classification agreed with the first examination. However, he found it harder to predict the development of the superior group during the first two years than to predict that of the mentally deficient.

Terman (1926), in a study of the early mental traits of geniuses, analyzed the records of 301 of the most eminent men and women of history who lived between 1450 and 1850. Information available in regard to their achievements showed them to have been eminent as children. Early evidence of outstanding ability was present in the majority of cases.

Not all types of mental development can be predicted with the same degree of accuracy. For children whose abilities are approximately normal, prediction can be made at an earlier age, and it is more apt to be correct than in the case of those who deviate markedly from the average. There are certain types of mental deficiency, such as cretinism and mongolism, that can be recognized early in the first year of life because of the physical symptoms that accompany them. In these one can generally predict with a high degree of accuracy what the final development will be. But, in cases of mental deficiency where there are no physical symptoms, diagnosis is difficult until the end of the first or second year, and, even then, prediction of the final development is often inaccurate.

8. Each Developmental Phase Has Traits Characteristic of It.—At each age, some traits develop more rapidly and more conspicuously than others. During the prenatal, babyhood, and early adolescent years, for example, physical development plays a more important role than during the other periods, and thus colors certain mental traits. Development of control over the body stands out as the predominant characteristic of babyhood, just as development of sociability and social cooperation are characteristic of late childhood, awkwardness of early adolescence, and "smartness," with a desire to show off and shock others, of late adolescence.

9. Many Forms of So-called "Problem Behavior" Are Normal Behavior of the Age in Which They Occur.—Each developmental age has certain undesirable forms of behavior which are normally found at that age and are outgrown as the child passes on to the next stage of development. Very often, parents who are not familiar with the undesirable forms of behavior which may be expected to appear at that age, take them seriously, feel that the child's life will be completely ruined by them, and do all within their power to overcome them.

A few examples will be sufficient to illustrate this point. During the elementary-school years, the typical boy revels in being dirty and slovenly in his appearance. His attitude is "Why bother to wash when I will just get dirty again?" While this may trouble his mother, it is serious from no other angle because the boy will soon swing to the opposite direction, becoming a fop in his appearance and interest in clothes during the adolescent years. Likewise, most girls at this age go through a man-hating phase. This they soon outgrow, and in a short time, after emerging into adolescence, they become as man-crazy as they were man-hating before.

10. Every Individual Normally Passes through Each Stage of Development.—While it is true that the time required to complete the development characteristic of each stage differs from one individual to another, nevertheless, except in unusual cases, the development will be completed at approximately twenty-one years of age. Inability to pass through all the developmental stages is correlated frequently with low-grade intelligence. Poor health, unfavorable environment, lack of incentive to develop, and many other factors may also retard the normal rate of development, but their influence is only temporary.

✓ FACTORS INFLUENCING DEVELOPMENT

As just hinted, development is not due to one factor alone but to many, each related to the others and interdependent. The relative importance of the different factors has never been determined, though it is evident that some play a more important role than others. These factors are as follows, listed, as nearly as possible, in the order of their importance:

1. Intelligence.—Of all factors influencing the development of the child, intelligence seems to be the most important. High-grade intelligence is associated with a speeding up of development, while low-grade intelligence is associated with retardation. Several examples will be sufficient to illustrate this point. The age of first walking and talking has been carefully studied in relation to the intelligence of the child, and the results have been found in Table II.

Likewise, the age of sexual maturing, or puberty, is influenced by the intellectual level of the child. Precocious, or "genius," children mature a year or two sooner than average children, while in the case of the mentally deficient, the idiot, imbecile, or low moron grades, sexual maturity either does not occur at all or is retarded in its appearance.

2. Sex.—There is ample evidence available at the present time to show that sex plays an important role in the physical and mental development of the child. Differences in the rate of physical growth are espe-

cially apparent. At birth, boys are slightly larger than girls, but girls grow more rapidly and mature sooner than boys. Girls, on the average, mature sexually a year before boys and, at this time, they are larger than boys. This is definitely apparent at the prepuberty age, from nine to twelve years. Girls also attain their full size sooner than boys. In mental growth, as measured by intelligence tests, there is a slight difference in favor of girls. Girls develop mentally earlier than boys and reach their mental maturity slightly sooner.

TABLE II.—AGES OF FIRST WALKING AND TALKING

	First walking, months	First talking, months
Very bright children.....	13	11
Moderately bright children.....	14	16
Morons.....	22	34
Idiots.....	30	51

Sources: TERMAN, L. M. *Genetic studies of genius*. Palo Alto: Stanford Univ. Press, 1926, Vol. 2, p. 244.
MEAD, C. D. The age of walking and talking in relation to general intelligence. *Ped. Sem.*, 1913, 20, 460-484.

3. Glands of Internal Secretion.—In recent years, studies in the field of endocrinology have shown the importance of the role played by certain of the glands of internal secretion in the physical and mental development of the child. These glands affect the development in both the prenatal and postnatal stages of growth. A few of those that are definitely known to influence growth will be used as illustrations.

Calcium is produced by the parathyroid glands, located in the throat, near the thyroids. Deficiency of these glands results in defective bone growth and hyperexcitability of the muscles. Iodine, produced by the thyroid glands, located in the throat also, is essential to physical and mental growth. Deficiency of thyroid activity, during the growth years, stunts the physical and mental development of the child, producing the "cretin," or deformed idiot. Mongolism, a type of mental deficiency characterized by facial features like the Mongols or Tartars, especially the sloping eyes, is believed by some endocrinologists to be due to a pituitary deficiency.

A too active thymus gland (located in the chest), or a too active pineal gland (located at the base of the brain), will retard normal development and keep the child physically and mentally childish too long. Deficiency in the activity of the sex glands delays the onset of puberty, while hyperactivity brings about a precocious sexual development. Extreme cases of gonad hyperactivity are known as *puberty praecox*, or early sexual maturity, in which the child may be sexually mature even between the

third and fourth years. And it is important to note that Gesell (1928) found that this produced a "dislocating effect" on the total growth complex: there was no markedly accelerated general mental development but, rather, irregularities in mental abilities.

4. Nutrition.—At every age, but especially in the early years of life, feeding is of great importance to the normal development of the child. It is not only the amount of food eaten that is important, the vitamin content is as important, if not more so, than the quantity. Defective teeth, rickets, skin diseases, and innumerable other disturbances can be traced directly to incorrect diet during babyhood and early childhood. The larger stature of the children of today, as well as that of children of the higher economic classes, is due in part to improved feeding in the early years of life.

5. Fresh Air and Sunlight.—The size, general health condition, and maturing age of the child are influenced by the amount of fresh air and sunlight the child gets, especially during the early years of life. This is very evident when comparisons are made between children from good and poor environments. Whether they affect the mental development as well as the physical is yet debatable.

6. Injuries and Diseases.—Any injury to the child, such as head injuries, toxic poisons from diseases and drugs, bacterial poisons from diseased tonsils, adenoids, or typhoid fever, will retard to a certain extent the child's development. Except when these conditions are very pronounced, the effect is limited almost exclusively to the physical development.

7. Race.—Racial differences in development show that children of the Mediterranean races develop physically sooner than the children of the countries of northern Europe. Likewise, children of the Negro and Indian races are slower in their development than are the children of the white and yellow races.

8. Position in the Family.—The position of the child within the family may influence his development more through environmental than through native factors. The second, third, or fourth child within a family generally develops more quickly than the first-born, not because of any pronounced intellectual difference but because of the fact that the younger children learn from imitating their older brothers and sisters. On the other hand, the youngest child of the family, especially if distinctly younger than the other children, is apt to be slower in his development because he is "babied" and given little incentive to develop his latent abilities. It has been claimed that the only child of a family, as a rule, develops more quickly along mental lines than children from larger families but is somewhat slower in motor development. In such cases, the mental acceleration of development would seem to be due to the child's constant contact with adults which stimulates mental develop-

ment, while the retardation would be caused by lack of motivation which results from having too much done for him.

DEVELOPMENTAL PERIODS

Scientific studies of children have shown that at different ages certain general forms of development are taking place which distinguish that age from the ones which precede and follow it. As the child emerges from one developmental period to another, there is a gradual shift in emphasis on the dominant form of development taking place at that time. While there is no clear-cut dividing line between the different periods, nevertheless, it is possible, on the basis of evidence derived from the study of large groups of children, to mark off major developmental ages, each characterized by its own specific form of development which overshadows in importance the rest of the development occurring at that age.

The five major developmental periods, with their characteristic forms of development, approximate ages, and names commonly applied to them, are as follows:

1. **Prenatal Period.**—This period extends from conception, when the female ovum is fertilized by the male spermatozoon, to the time of birth, roughly nine calendar months or 280 days. While the prenatal period is a short one, it is, nevertheless, one of extremely rapid development. Developing from an organism microscopically small to an individual weighing six to eight pounds and measuring approximately 20 inches in length is without question rapid growth. The primary development taking place at this time is physiological and consists of the growth of all the bodily structures.

2. **Infancy.**—Beginning with birth and extending to the age of ten to fourteen days is infancy, the period of the *neonate* or the *newborn*. This is a plateau or resting stage in human development. It is at this time that adjustment to a totally new environment, outside of the mother's body, must be made, and thus the infant learns to be self-dependent. During this time growth, for the most part, comes to a standstill temporarily, and is not resumed until the infant has learned to cope successfully with his environment.

3. **Babyhood.**—The third developmental age in the child's life is babyhood, a period extending from the age of two weeks to approximately three years. This is the age of helplessness because of the baby's necessity for depending on others for his every need. Gradually the baby becomes more independent through learning to control his muscles so that he can feed himself, walk, dress himself, talk, and play. Accompanying this self-reliance is an attitude of independence, which is apt to make the child resent being "babied."

4. Childhood.—Strictly speaking, the childhood years include the years from age three to puberty, though the entire period of immaturity, from birth to maturity, is often called *childhood*. Development at this age is characterized first by growth of control over the environment. The child who, as a baby, learned to control his body, now seeks to gain control over his environment so that he can make himself a part of it. When he is not able to do this, he relies upon the use of speech to gain the information he seeks. As a result, he is often a "living question-mark." In addition to this, the child learns to make social adjustments at this age. From approximately the sixth year, socialization is of paramount importance. The name "gang age" is commonly given to this period because group activities of all sorts play so important a role in the child's life.

5. Adolescence.—The adolescent years extend from the onset of puberty, between the ages of eleven and thirteen years in the average child, to the age of maturity, twenty-one years. Because this is such a long developmental age and because different forms of development occur at different times within this age, it may be subdivided into three shorter periods, (a) *preadolescence*, (b) *early adolescence*, and (c) *late adolescence*.

a. Preadolescence.—This is a short period, approximately a year long, immediately preceding adolescence proper. In girls it generally occurs between the eleventh and thirteenth years, while in boys it comes approximately a year later. Charlotte Bühler of Vienna has called this the "negative phase" because there is normally a negative attitude or an "about-face" in behavior at this time. Rapid physiological development of the sex life of the child seems to upset, temporarily, the emotional and social control developed in earlier ages.

b. Early Adolescence.—This period follows preadolescence and extends to the age of sixteen to seventeen years, thus coinciding with the high-school age. Very often it is called the "awkward age," because of the awkwardness, clumsiness, and accompanying self-consciousness which so frequently occur. During this time, physical and mental growth are completed.

c. Late Adolescence.—This last developmental age, coinciding roughly with the college age, is often referred to as the "smart" or "show-off" age because of the keen delight which the normal boy or girl in this phase of development shows in being the center of attention. The most important forms of development which occur are adjustment to a mature form of life in which the child learns to be independent of adults and plan his life according to his own wishes. In addition to this, there is adjustment to members of the opposite sex, in which the adolescent gradually learns to get along with members of the opposite sex in work and social activities.

In general, late adolescence may be looked upon as the last step in the long period of development which begins at the time of conception. By the end of late adolescence, development has reached a point where the individual is legally and socially regarded as mature, and thus capable of living an independent life, free from the supervision and guidance of others.

CHAPTER III

PRENATAL DEVELOPMENT

Life does not begin at birth, as many believe, but at the time of conception, approximately nine months before birth. Growth during the prenatal period is very rapid, resulting in the development of an organism capable of a large number of complex activities in the short span of nine months. Birth is therefore merely an interruption in the normal development of the individual, caused by a change in environments from that of the mother's body to that of the world outside of the mother's body.

PERIODS IN PRENATAL DEVELOPMENT

The prenatal period, which extends over nine calendar months, or ten lunar months, is approximately 280 days long. This period may be divided roughly into three subdivisions: (1) *the period of the ovum*, which extends from the moment of fertilization to the end of the second week; (2) *the period of the embryo*, which extends from the end of the second week to the end of the second month; and (3) *the period of the fetus*, which extends from the end of the second month to birth. Each one of these periods is characterized by development peculiar to it. In making a survey of the prenatal development of the human infant, this subdivision into three periods will be followed.

At no time during the prenatal period is the developing organism just a miniature adult in proportions, as may be seen in the accompanying diagram (Fig. 6).

The proportions of the entire body, as well as the different bodily structures themselves, are different. Likewise, the behavior of the individual before birth differs from that of the full-term infant after birth.

METHODS OF STUDYING PRENATAL DEVELOPMENT

Speculation about the origin of life occurred in ancient times among primitive peoples, and among civilized peoples. Because primitive peoples did not associate intercourse between the sexes with the birth of the child, many theories of a mystical sort grew up to explain birth. Greek philosophers, on the other hand, recognized the fact that sexual relationship always precedes the birth of a baby and, with this knowledge in mind, evolved a theory which maintained that the woman was the receptive soil in which the seed from the male was planted. This

theory held that the role of the mother was to supply nourishment for the developing baby, and the source of this nourishment was believed to be the menstrual blood which ceased flowing during the period preceding the child's birth. Never, in ancient times, was there any recognition of the fact that the mother produces a seed, which, when united with the male seed, gives rise to a new individual.

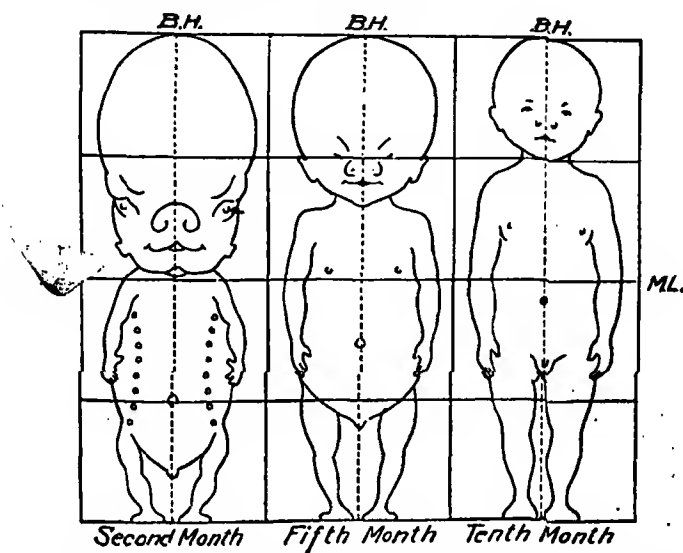


FIG. 6.—Body proportions during the prenatal period. B.H., body height; M.L., midline. (From C. Murchison, *A handbook of child psychology*, 2d ed. Year-Clark Univ. Press, 1933.)

Later Theories.—It was not until the seventeenth century that the woman's contribution to the fertilization of the male seed was recognized. During that era, de Graaf, a Dutch physician, suggested that the woman supplied an egg. A few years later, a Dutch spectacle maker, van Leeuwenhoek, reported that "little animals," or what are now known as *sperm cells*, were found in the male semen, and these, he contended, were the male contribution to the new human being. During the nineteenth century scientists recognized that the union of the egg and the male cell was essential to the creation of a new organism. Since this discovery, a lively interest in embryology has arisen, with the result that our knowledge of prenatal development is not only more extensive but also more accurate with each succeeding decade.

Studies of the Embryo.—Study of the development taking place before birth is extremely difficult and, in some cases, almost impossible in human subjects. Our knowledge of the growth occurring at this time is of necessity limited by the difficulties involved in the study itself.

Information about development during the first two months of life comes from studies of animals or from human embryos operatively removed from the mother's body.

Studies of the Fetus.—Information about the living fetus comes from three sources: (1) the mother's report of fetal movements; (2) sounds of fetal heartbeats and movements detected by instruments used on the mother's abdominal wall; and (3) direct observations of fetuses operatively removed because a diseased condition of the mother necessitated the artificial termination of pregnancy.

Reports given by mothers in regard to fetal movements are, like all introspective reports, subject to error. How accurately the mother will be able to report will depend, in large measure, on her interest in the subject and on her training in scientific techniques. For the most part, the only information of importance to be derived from this technique is the fact that the prenatal activity is pronounced enough for the mother to be able to feel it and localize it.

Information from the doctor's examination includes data in regard to the fetal heartbeat and movements, position of the fetus, and whether or not there will be twins. In order to determine the maturity of the fetus, Sontag and Wallace (1934, 1935) placed on the abdomen of pregnant women an apparatus made up of rubber sacks, connected with tambours that actuated recording pens. Sounds were produced directly over the fetus's head by a doorbell, a buzzer, and a wooden knocker vibrated against a disk. The sounds caused movements of the fetus to occur, and the movements became more marked as time progressed and as the fetus reached full term.

Direct observations of a human fetus are impossible except in the case of fetuses from miscarriages, abortions, and premature births. These fetuses are rarely "normal" but are defective in one aspect or another, which has led to the early termination of pregnancy. The procedure used by Minkowski (1921-1928*a*) illustrates the third method of studying the fetus. It consisted of taking the fetus alive from the mother's body by Caesarean section under a local anesthetic. The fetus was then placed in a bath of physiological salt solution at normal blood temperature to prolong its life and make experimental study possible. This technique involves cutting off the fetus from normal oxygen supply, and the movements observed are thus the movements of an increasingly asphyxiated organism with increasing metabolites in the blood, which results first in hyperactivity and then hypoactivity.

Studies of Prematurely Born Infants.—It is obviously not justifiable to take evidence uncritically from prematurely born infants to interpret fetal behavior, because a change in the environment produces different reactions in the infant as compared with the fetus. For example, changes

from placental to pulmonary respiration, from amniotic fluid to life in the air, or from a relatively constant external stimulation of the intra-uterine environment to the varied and changing one outside of the uterus make comparisons difficult. For that reason, data concerning prenatal development must come from the three sources listed above.

THE MECHANISMS OF INTRA-UTERINE DEVELOPMENT

What the individual is, and what physical and mental traits he possesses, are determined by the type of parents, grandparents, and other ancestors he had. What is transmitted from parent to offspring is not the trait itself but something which will determine the form the trait will take in the offspring. This is the "gene," the true carrier of heredity.

Carriers of Heredity.—In bisexual reproduction, characteristic of many species, including man, the individual begins his existence as a single cell, the fertilized germ cell or *zygote*. This cell is formed by the union of two germ cells, one from the male and the other from the female parent. The outer ring of the cell is the *cytoplasm*, which consists of a mass of relatively undifferentiated protoplasmic material. The function of the cytoplasm is still unknown. Within the cytoplasm is the *nucleus*, the "life-giving" part of the cell. This contains the *chromosomes*, of which there are 24 pairs in the human sex cell. Each chromosome consists of a string of minute particles, the *genes*. The genes are the physical substances passed on from parent to offspring and thus are the true carriers of hereditary traits.

Except in the case of pairing of X and Y chromosomes (see section on Determination of Sex), chromosomes are always arranged in pairs, with the two members of each pair exactly alike in size and appearance. Each contains the same number of genes arranged in the same order. One of the chromosomes in each pair comes from the father and one from the mother. They remain distinct, and each chromosome contains genes from the parent from which it originated. In the fertilized germ cell of the human being, there are 24 pairs of chromosomes, half of which have come from the mother and half from the father.

Maturation of Sex Cells.—The maternal and paternal germ cells, which later unite to form the fertilized cell, have been developed in the reproductive organs, the *gonads*. The male gonads, the *testes*, produce the male germ cells, the *spermatozoa* (singular—spermatozoon), while the female gonads, the *ovaries*, produce the female germ cells, the *ova* (singular—ovum). Before these sex cells can fertilize or be fertilized and thus give rise to a new individual, they must become mature, or go through a process known as *maturation*. This takes place after sex maturity has been attained by the boy or girl, following the onset of puberty.

Maturation consists of chromosome reduction through cell division, in which one member of each pair of chromosomes is lost. The result is a *haploid cell*, or a cell with one-half its usual number of chromosomes. This has come about because every immature sex cell, whether male or female, has divided into four mature cells, each with 24 chromosomes. In the process of division, the 48 chromosomes of each cell arrange themselves into 24 pairs on opposite sides of the nucleus, each pair containing one chromosome from the father and one from the mother. When the pairs separate, one chromosome goes to one cell and its mate to another (see Figs. 7 and 8).

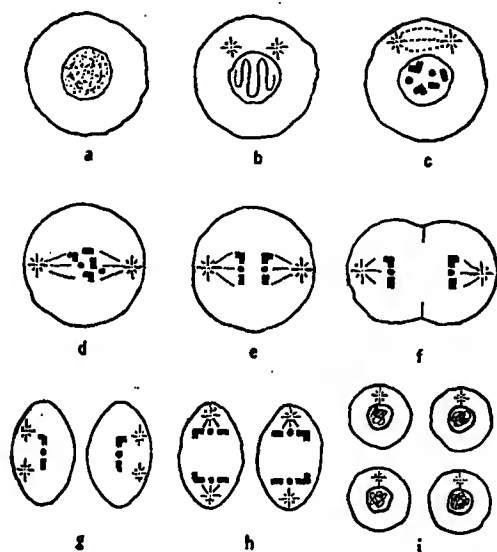


FIG. 7.—Maturation of sperm. (From F. Teagarden, *Child psychology for professional workers*. Prentice-Hall, 1940.)

There is no specific scientific knowledge in regard to the way the pairs divide. Division seems to be a matter of chance. In one cell, after division has occurred, there may be 20 chromosomes from the female and 4 from the male, or 8 from the female and 16 from the male, or any other combination. For that reason when one cell combines with another in fertilization, it is possible and probable that more traits will be inherited from one side of the family than from the other. This explains the "skipping of a generation" in a given trait.

The male cell, the sperm, divides into four cells, or *spermatids*, each of which is capable of fertilizing a female cell. The spermatids are known as *gametes*, or "marrying cells." When division occurs in the female cell, one chromosome from each pair is pushed outside the cell wall. These are known as the *polar bodies*, and they cannot be fertilized. In the

process of division, three polar bodies are formed, smaller in size than the *ovum* or gamete, which is capable of being fertilized. The polar bodies are soon absorbed and secreted. The ovum, unless it is fertilized, later disintegrates and passes from the body with the menstrual flow. Each sperm cell and each ovum, when mature, contains 24 chromosomes.

Ovum vs. Spermatozoon.—There are several outstanding differences between the ovum and the spermatozoon:

1. The ovum is large as compared with the other cells of the body; while the spermatozoon is among the smallest cells of the body. The

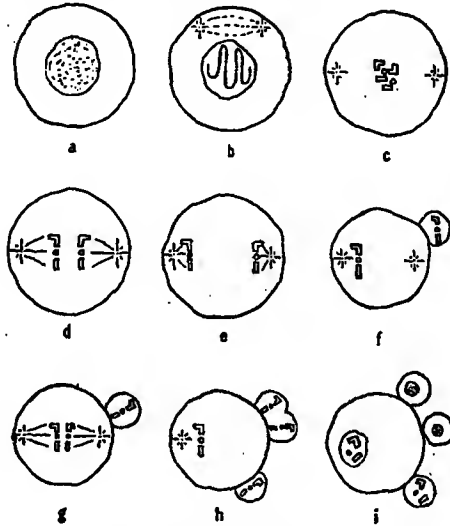


FIG. 8.—Maturation of ovum. (From F. Teagarden, *Child psychology for professional workers*, Prentice-Hall, 1940.)

ovum is approximately 0.1 millimeter in diameter and is barely visible to the human eye. The spermatozoon is microscopically small in size, approximately 0.5 millimeter in diameter. The cause of the difference in size is the yolk, or food material for nourishment of the new individual, which the ovum contains in addition to its chromosomes. Should the ovum be fertilized, it could exist with the nourishment from the yolk until it attaches itself to the wall of the uterus and becomes a parasite.

2. The ovum is round in shape and nonmotile, with no means of locomotion within itself. It therefore has to depend entirely upon the contractions of the tissues by which it is surrounded for its movements. The spermatozoon, on the other hand, is elongated in shape and very motile. It is made up of a head consisting chiefly of the nucleus, which is composed primarily of bundles of genes, as is true of the nucleus of the ovum. Back of the head is the body, an elongated portion, to which is attached a cilium or fine, hairlike tail, which, by lashing back and forth,

enables the spermatozoon to swim forward through the semen in which it is released.

3. While normally only one ovum is produced in each menstrual cycle, approximately 28 days, the spermatozoa are very numerous, with as many as 200,000,000 found in 3 cubic centimeters of seminal fluid in one ejection.

4. The ovum carries a large bulk of cytoplasm, containing the nucleus, which is made up almost entirely of bundles of genes, and some yolk which assists in nourishing the embryo. The spermatozoon, on the other hand, has a minimum of cytoplasm.

5. The ovum contains 24 matched chromosomes while half of the spermatozoa contain 23 matched and 1 unmatched, and half, 24 matched chromosomes. The significance of this difference in number of chromosomes in the spermatozoa will be discussed in the section Determination of Sex.

Beginnings of Life.—How life begins, and the sources from which the new organism develops, must be clearly understood if the picture of human growth is to be complete. The early stages of growth and the approximate times at which they occur are as follows:

1. *Ovulation* is the process of maturing and escape from an ovary of one ovum during each menstrual period. The female ovary is made up of a mass of follicles containing ova which, if and when they develop, will be capable of being fertilized by male germ cells. It has been estimated that at birth there are approximately 200,000 ova, many of which will atrophy during childhood, leaving only about 30,000 when the girl reaches puberty. Of these, approximately 400 mature between the onset of puberty, between thirteen and fifteen years of age, and the onset of the menopause in the middle forties.

During every menstrual cycle of about 28 days each, one of the follicles swells, is pushed to the surface of the ovary, ruptures, and expels a tiny ripe ovum. Though not definitely proved to be true, it is generally believed that the two ovaries alternate in this function with one ovary producing an ovum one month and the other, the next month.

After being released from the ovary, the ovum enters the open end of the nearest Fallopian tube and is propelled along the tube by means of cilia which line the tube. Ovulation generally occurs between the fourteen and seventeenth day following the onset of menstruation. The ovum remains in the Fallopian tube for a period of time, ranging in length from three to seven days, before it reaches the uterus.

2. *Fertilization*, or conception, consists of the formation of a fertilized egg, or *zygote*. Before the sperm cell reaches the ovum, it has to travel a long and hazardous path from the male sex glands, the *testes*, to the female ovary. In normal fertilization, the ovum is in the Fallopian tube on its

way from the ovary to the uterus. Fertilization is believed to take place shortly after the ovum enters the tube. As a result of coitus, spermatozoa are deposited at the mouth of the uterus and make their way toward the tubes. They are attracted to the ovum by a strong hormone attraction, which draws them into the tubes, and are aided by the force of the rhythmic muscular contractions of the walls of the tubes.

The sperm must reach the ovum before it loses its energy. It is believed that a healthy sperm cell can wait in the female sex organs before losing too much of its energy to be able to penetrate the ovum. If the ovum is not fertilized while it is in the Fallopian tube, it will die in the uterus and be expelled with the menstrual flow. This means that fertilization can occur only during a few days in approximately the middle of the menstrual cycle.

Occasionally the fertilized ovum does not move down through the Fallopian tube in which fertilization took place but remains in the tube. This is known as a *tubal pregnancy*. Because complete fetal development is impossible in the tube, it is then necessary to remove the fertilized ovum surgically. Occasionally, fertilization occurs in the abdominal cavity, which likewise necessitates surgical removal.

After one sperm enters the ovum, the surface of the ovum is so changed that no other sperm cells can penetrate it. Thus, the fertilized ovum is completed when contact with one sperma has occurred. When the sperm cell penetrates the wall of the ovum, the nuclei from the two cells approach each other. In time, there is a breakdown in the membrane surrounding each, and this allows the two nuclei to merge. The new cell, thus formed, has the original number of chromosomes, 24 pairs, one-half of which came from the male and one-half from the female cell.

At the time of fertilization, not only is a new individual created, but the hereditary traits as well as the sex are determined. The maternal and paternal chromosomes join to form the paired arrangement referred to above. The importance of this lies in the fact that each offspring receives from his parents determiners of traits which they received from their parents, grandparents, and other ancestors. Some of the traits that the parents received cannot be passed down to their offspring because they are lost when the cell divides.

Because each human being, whether male or female, produces many more germ cells than will ever be used, and because in each of these cells are genes from both parents in varying numbers, two important points must be remembered: (1) it is impossible to predict with any degree of certainty what the offspring will be like, since the genes are assorted by chance; and (2) the genes carry the traits of the ancestors of the individual and may produce in the offspring traits that are traceable to one or more of the ancestors, even though they may not be found in either parent.

STAGES IN INTRA-UTERINE DEVELOPMENT

As was pointed out at the beginning of the chapter, the development that takes place before birth, the *intra-uterine*, or development within the uterus, may be divided into three stages: the period of the ovum, the period of the embryo, and the period of the fetus. Each of these will be discussed in detail.

THE PERIOD OF THE OVUM

This period extends from the moment of fertilization to the end of the second week. During this time, the individual retains an egglike organization. Its size remains practically unchanged because it receives little or no external nourishment. Marked changes, however, occur in the internal structure of the *zygote*, or fertilized egg. A process of cell division, known as *cleavage*, occurs, and this marks the beginning of development. The single cell divides and subdivides many times until a globular cluster of many cells is formed. A small cavity forms within the mass of cells, thus resulting in an outer and separated inner cluster of cells. The outer layer develops later into accessory tissues that protect and nourish the embryo. Part of the inner cluster of cells develops into the embryo.

This cell division takes place as the fertilized ovum is carried down the Fallopian tube to the uterus. By the time it reaches the uterus, it is about the size of a pinhead, though its size varies according to how long it has been in the tube after being fertilized. During the first week of this period, the fertilized ovum is unattached and free-moving.

After fertilization has occurred, the lining of the uterus changes in structure to be ready to receive the fertilized ovum. When the ovum reaches the uterus, it quickly implants itself in the uterus wall and sinks from sight. At the spot where it comes to rest, the placenta develops. This is the temporary organ from which the umbilical cord extends to the ovum. Through it, nourishment passes from the mother's blood stream and waste products are eliminated. The ovum, thus implanted, becomes a parasite, receiving its nourishment from the mother. *Implantation* occurs about 10 days after fertilization.

THE PERIOD OF THE EMBRYO

The period of the embryo extends from the second week to the end of the second month. It is a time of rapid change. By the end of this period, the embryo represents a miniature individual in his development. From then on, the major changes that take place consist of changes in actual or relative size in the parts of the body already established, rather than the appearance of new features.

After implantation, the cell mass which started to develop immediately after fertilization, differentiates into three layers, the *germ layers*, from which all parts of the body develop. These layers grow unequally, with folding in and out of the portions of the layers, and thus give rise to the different body structures. The outer layer, the *ectoderm*, produces the epidermis of the skin, hair, nails, parts of the teeth, skin glands, sensory cells, and the entire nervous system. The middle layer, the *mesoderm*, gives rise to the dermis, or inner skin layer, the muscles, circulatory and excretory organs. From the innermost layer, the *endoderm*, come the lining of the entire digestive tract, the Eustachian tubes, trachea, bronchia, lungs, liver, pancreas, salivary glands, thyroid glands, and thymus.

The *placenta*, a sac made up of four membranes which develop around the embryo shortly after implantation, serves to protect the delicate tissues of the embryo. On the side attached to the uterus, the placenta is thick and full of blood vessels, while on the outer side it is relatively thin. The placenta grows as the embryo grows. At the end of the third week, it covers one-fifth of the inner surface of the uterus; by the second month, one-third of the inner surface; and by the fifth month, one-half. From then until the end of pregnancy, there is little change in the size of the placenta, but changes in thickness take place. At the time of its maximum size, near the end of pregnancy, the portion of the placenta attached to the uterus is about 8 inches in diameter, approximately 1 inch thick in the center where the cord is attached, but thin around the edges. After the baby has been born, the placenta is discarded as *after-birth* because its usefulness has ended.

The *membranes* that makes up the placenta are (1) the *amnion*, a delicate, transparent coat inside of which, on the side which comes in contact with the uterus, is the cell mass from which the embryo develops. This amniotic sac, or "bag of water," is filled with amniotic fluid, a highly protective fluid which equalizes any pressure against the embryo. (2) The *chorion*, a rough, shaggy layer covered with villi, or fringelike projections, which surrounds the amniotic sac. The villi sink into the walls of the uterus like roots where the embryo comes in contact with the uterus. In time, they become more branching and rootlike, while the external surface becomes smoother. (3) The *decidua*. These are two layers of uterine membrane which fold over the chorion after the fertilized ovum has sunk into the lining of the uterus. The inner decidual layer and the chorion interlock closely.

Within the villi or rootlets, where the ovum attaches itself to the uterus, the *umbilical* cord develops. In time, this cord may become 10 to 20 inches long and the thickness of a man's finger. It contains three blood vessels: a vein which carries blood passively back to the

fetus, and two arteries which carry impure blood from the fetus to the placenta. There is no nerve connection between the mother and the fetus, nor is there a direct union of maternal and fetal blood vessels.

End of First Lunar Month.—By the end of the first lunar month, the embryo is cylindrical in form, approximately $\frac{1}{4}$ inch long, and equals the size of a pigeon egg. The entire sac of amniotic and chorionic membranes is formed by then. The embryo lacks a face and neck, with the result that the heart lies close to the brain. There is a wide, deep hole for the *mouth*, below which is a short, arched bar which later will form the *lower jaw*. On the side of the head are slitlike depressions like the gill slits of

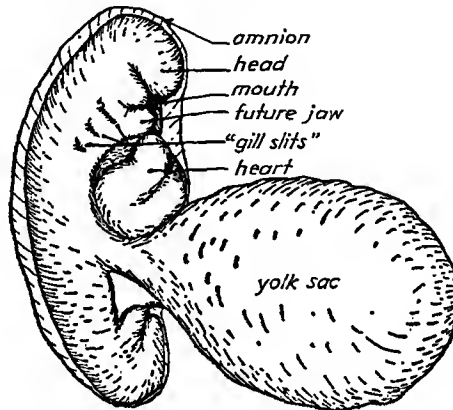


FIG. 9.—A human embryo of the fourth week (2.6 millimeters). Note the large yolk sac suspended from the belly, and the large, bulbous heart; there is no face, neck, or belly wall. Magnified 40 times. (After His, from M. S. Gilbert, *Biography of the unborn*. Williams & Wilkins, 1939.)

fish. The *eyes*, *nose*, and *ears* have started to form, though not on the surface. The sensitive tissue, which will later constitute the real *sense organs*, appears at this time.

In the trunk, most of the *internal organs*, the heart, lungs, liver, stomach, intestines, thyroid, and thymus glands are discernible. A type of *kidney*, like a group of little tubules in the mesoderm, forms in the region where the neck will develop. About the twenty-second day, this primitive type of kidney degenerates, and a new type starts to develop. At this time, the medullary groove which will eventually develop into the *brain* and *spinal cord* begins to form. At the end of the month, the three parts of the *brain* may be distinguished. At the end of the third week, the *heart* is prominent and starts to function. Finlike structures attached to the embryo are the forerunners of *limbs*, and *muscle tissue* is differentiated. There is a short, pointed tail curled up below the belly, and, when the head is bowed, the embryo looks like a ball. Figure 9 shows the state of development at the end of the first lunar month.

End of Second Lunar Month.—By the end of the second lunar month, the embryo is approximately $1\frac{1}{4}$ to 2 inches long and weighs about 2 grams, or $\frac{2}{3}$ ounce. This is an increase of about 2,000,000 per cent since fertilization occurred. Its form is so well developed that it is distinctly human and would not be mistaken for an animal. The head development is the most pronounced of the entire body. The *eyes* are now in front of the face, with *cyclids* in the form of folds of skin above the eyes. The *ears* closely resemble those of a human being but are low on the side of the embryo's head. The *mouth* opens, and the *lower jaw* is small so that the embryo is almost chinless. There is a single broad *nose* and a large, bulging *forehead*. The *body proportions* differ from those of the newborn in that the head of the embryo is enormously large while the arms and legs are tiny.

The *trunk* is no longer potbelliced, but is elongated and rounded, so that it resembles that of a human. Most of the internal organs are apparent. The *liver*, which is one-tenth of the entire body volume, crowds the rest of the organs. Bile is secreted from it at this time. The *intestines* are shoved into the umbilical cord, and the *appendix* appears. The *diaphragm* is a sheet of tissue which divides the chest from the abdominal cavity. The *sex organs* are now differentiated in both the internal and external structures, so that it is possible to distinguish the sex of the embryo in a large percentage of cases.

The *arms* have elbows and webbed fingers while the *legs* have knees and webbed toes. The *tail* of the embryo reaches its maximum development at this age and then regresses. Most of the *muscles* of the body are formed and some of them, especially the muscles of the arms and legs, are capable of functioning. No bone is deposited at this time. There is a *cartilage* formation of backbone, ribs, collarbone, arm, and leg bones which have the shape of the bones they represent. Around the middle of each cartilage is a narrow sheet of hard bone which, in succeeding months, spreads nearer to the surface while the cartilage degenerates and disappears.

The *umbilical cord* shows regular spinal twists, owing, it is believed, to the turning of the fetus in the uterus. In operatively removed fetuses, *spontaneous movements* can be observed. These movements are worm-like contractions of the arms, legs, and thorax. They are ideo-muscular in character and not evoked by external stimulation. *Peristaltic movements* may begin as early as the seventh week.

THE PERIOD OF THE FETUS

The period of the fetus extends from the end of the second month to the time of birth, which normally occurs at the end of the tenth lunar

month. It is characterized chiefly by the growth and development of the parts of the body established in the second period, the *period of the embryo*, rather than by the appearance of new parts. A brief description of the development which normally occurs at the end of each lunar month of this period will give a general picture of the growth of the fetus.

Three Months Old.—At the end of the third lunar month, the fetus measures approximately $3\frac{1}{2}$ inches long and weighs about $\frac{3}{4}$ ounce. By this time, development is so well advanced that the fetus represents a miniature individual with a disproportionately big head. In the face, the *upper and lower jaws* are formed. *Tooth buds* for the 20 temporary, or "baby," teeth, and sockets in the jaws make their appearance. The *lips*, *gums*, and *vocal cords* can also be distinguished. *Cheek* and *nasal bones* are well enough formed to give shape to the face.

The *internal organs* are not only well developed but they begin, in some instances, to function at this time. The *stomach* lining secretes mucus, the *liver* pours bile into the intestines, and the *kidneys* secrete urine, which seeps from the bladder into the amniotic fluid. The *islets of Langerhans*, the cells in the pancreas that secrete insulin, are fully developed, but it is not known whether they secrete insulin at this time.

By the end of the third month, *sex* is differentiated. At this time, all the changes that distinguish the male from a nonsexual embryo are apparent. There is marked development, for example, in the *sexual ducts*, the penis is longer than it was the month before, the tip of the penis is thickened, and the beginning of the *glans*, or opening, appears. In the female fetus, sex development is slower, and the fetus still retains the features of indifferent sexuality.

The *nervous structure* necessary for reflexes, including the peripheral nerves, spinal ganglia, medullary area, anterior and posterior roots are present but in an embryonic state. At $2\frac{1}{2}$ months, no medullated fibers are present, and there is only a slight differentiation apparent in the outer zone of the cord. The fetal *heartbeat* is audible when a stethoscope is used.

The *muscles* are well developed, and spontaneous movements of the arms and legs may be observed. These movements are more marked than they were earlier in the preceding month, though they are still asymmetric, uncoordinated, and arrhythmic. A direct stimulation of operatively removed fetuses, three months old, brings contractions of some of the muscles. The *plantar flexion* of the toes in response to stimulation on the sole of the foot, as well as *tonic neck* and *labyrinth* reflexes, appears by this time.

Four Months Old.—By the end of the fourth lunar month, the fetus measures 6 to 7 inches in length and weighs from 4 to 5 ounces. The *head* has reached one-half of the birth size by this time, although the other

parts of the body do not attain one-half of the birth size until one month later. The *face* is well modeled, the *lips* outlined with the upper projecting beyond the lower; the *eyes* are closed and the *nostrils* plugged. The *hands* and *feet* are also well formed.

Most of the *bones* are distinctly indicated throughout the body and certain of the skull bones show ossification. The *skin* is dark red because it is so thin that the blood may be seen coursing through the vessels. It is also very wrinkled, owing to the small amount of subcutaneous fat present at that time. A body hair, *lanugo*, starts to develop and appears

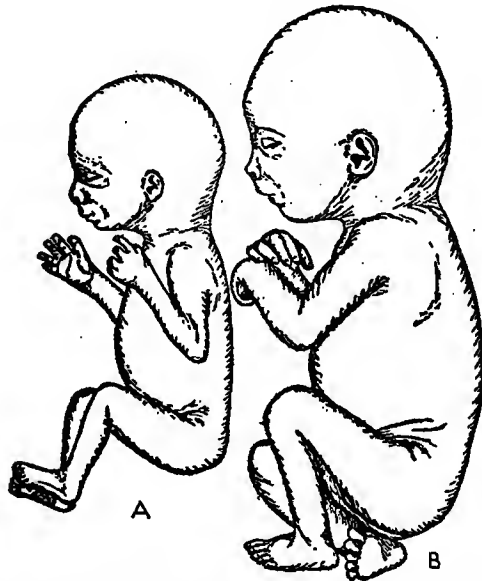


FIG. 10.—Two fetuses of the fourth month, one-half actual size. (A) Early in the month (117 millimeters). (B) Near the end of the month (155 millimeters). (After Retus, from M. S. Gilbert, *Biography of the unborn*. Williams & Wilkins, 1939.)

first on the face. The *placenta* becomes larger at this time and the *cord* larger and longer. A farlike substance, *meconium*, appears in the intestines. In the female, the *sex organs* develop in the internal as well as the external portions, thus lagging about one month behind the male.

The *muscles* by now are capable of spontaneous movements, and they are more rhythmic and coordinated than before. The arms and legs flex and stretch rhythmically. These movements are pronounced enough to be felt by the mother when the arm and leg thrusts are against the walls of the uterus. Stimulation of the soles of the feet of operatively removed fetuses brings responses of the toes with extension dominating over flexion. By the fourteenth to sixteenth week, *fetal heartbeat* can be

detected by a stethoscope. Figure 10 shows the state of development at the end of the fourth lunar month.

Five Months Old.—At the end of the fifth lunar month, the fetus measures approximately 10 inches and weighs about 9 to 10 ounces. *Hair* appears on the head and body. The *eyebrows* and *eyelashes* start to develop. The enamel and dentine of the first set of *teeth* are deposited at this age, and *finger* and *toe nails* are beginning to form. Ossification has begun in the pelvic bones. Marked development takes place in the *skin*. The *sweat glands* appear, but they have no opening on the surface until several months later. *Sebaceous glands* are formed at the base of each hair. They pour out a fatty secretion which, when combined with the dead cells that slough off from the skin, produces a cheeselike substance, the *vernix caseosa*. This serves to protect the fetus from the amniotic fluid which contains urine and chemicals secreted by the fetus.

At this time, the *internal organs* assume positions nearly like those of an adult. This, in turn, causes the body of the fetus to straighten out somewhat. The movements of the fetus can be felt distinctly by the mother. They can also be felt when the hand is placed on the outside of the mother's abdomen. Direct stimulation of the cortex leads to no response, but stimulation of the medulla brings about a change in heart-beat and chest movements involving the diaphragm, thoracic, abdominal, and neck muscles.

Six Months Old.—When the fetus is six months old, it measures about 12 inches in length and weighs about 1 pound. *Fat* development under the skin is apparent. The *eyelids*, which have been shut since the third month, now open. The *eyes* are completely formed but are not responsive to light until sometime during the seventh month. The *iris* is a gray-blue color and remains such until after birth. The second set of *teeth* is beginning to form in the jaws and the *lips* are well defined with transparent skin separated from the opaque, thus making the lips red. *Taste buds* are present not only over the tongue but on the roof and walls of the mouth.

The *tendon reflexes* occur and the *sucking reflex* is present when the mouth and tongue are stimulated directly. In operatively removed fetuses, *crying* sometimes occurs at this age. If the fetus is born prematurely, it may live for several hours. Its chances of survival are greatly increased if it is placed in an incubator. This shows that the *lungs* and many organs of the body are well enough developed to function even though the growth cycle has not been completed.

Seven Months Old.—One month later, at the end of the seventh lunar month, the fetus normally measures 14 to 15 inches in length and weighs between 2½ and 3 pounds. This is the *age of viability*. The fetus has a chance of living if born at that time because of the greater development of

nervous system now than during the previous month. In the male fetus, the *testes* descend into the scrotal sacs. This is essential if, later in the life of the individual, fertile sperm cells are to be formed.

The *eyelids* are open, and the skin, under which there is definite *fat formation*, is covered with a greasy substance. The pupillary response may be observed in prematurely born infants, and eye movements of an uncoordinated type are apparent. These are, for the most part, in the horizontal direction and are more often inward than outward. *Abdominal reflexes*, the *knee jerk*, the *plantar reflex*, and the *corneal reflex* all occur at this age.

Eight Months Old.—By the end of the eighth lunar month, the fetus is from 16 to 18 inches long and weighs from 4 to 5 pounds. *Finger*, and

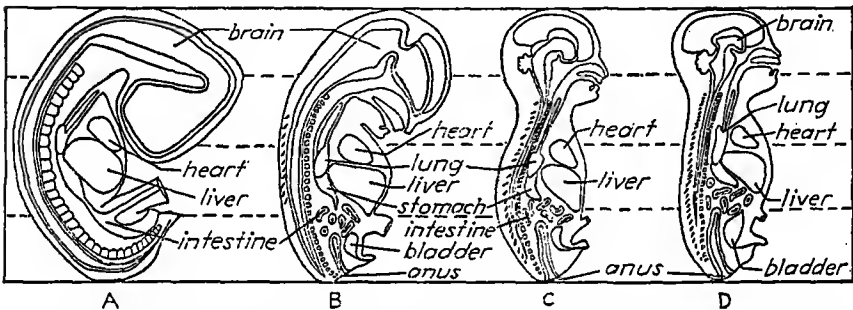


FIG. 11.—Diagrams of fetuses of two months (A), three months (B), five months (C), and nine months (D), all brought to the same height. The main internal organs are shown in their proper relative size and position. (Adapted from Broman and Jackson, from M. S. Gilbert, *Biography of the unborn*. Williams & Wilkins, 1939.)

toe nails are developed by this time. *Fat* has formed over the body and fills out the skin. The *skin* itself is not so red as before, but appears to be pink. Even Negro fetuses are light skinned. The body hair, or *lanugo*, begins to disappear except on the back and shoulders, where it often remains until birth or even later. Some of the *taste buds* begin to degenerate, with the result that at birth there are fewer than at seven months. The fetus is very *active*, and its movements are readily detected by the mother. All the *tendon reflexes* are present now.

Nine Months Old.—By the end of the ninth lunar month, the fetus is approximately 18 inches long and weighs from 5½ to 6 pounds. The *body* is completely formed, and even the *nails* extend to the finger tips.

Ten Months Old.—The end of the tenth lunar month marks the completion of prenatal development. By that time, the fetus is about 20 inches long and weighs from 7 to 7½ pounds. This means that 90 per cent of the *weight* of the fetus was taken on during the second half of pregnancy. *Individual differences* in appearance and behavior, which began as early as the third month, are very apparent at this time. In

Fig. 11 are diagrams showing the relative development of fetuses of different ages.

THE DETERMINATION OF SEX

For centuries, two outstanding problems have existed in relation to the determination of sex: the first consists of an attempt to *predict*, early in pregnancy, the sex of the unborn child; and the second, to *control* the sex desired. Because so many superstitious beliefs and practices have grown up as a result of the desire to meet these problems, a brief survey of the most common superstitions will serve to show how important a role they have played in the past.

Predicting Sex.—Attempts to predict the sex of the developing fetus have been numerous and, for the most part, ludicrous. A coin tossed over the shoulder of a pregnant woman would, if it came up "heads," foretell the arrival of a boy baby while "tails" meant a girl. In German folklore there is the superstition that if barley or wheat is soaked in the urine of a pregnant woman and then planted in the ground, the sex of the fetus can be detected by the one that grows first. Should it be barley, the offspring would be a girl, while wheat would forecast the arrival of a boy.

Recently, more scientific techniques have been used to predict sex. The *heartbeat test* maintains that if the fetal heartbeat is 125 or less per minute, the fetus is a boy; 144 or more heartbeats per second means that the fetus is a girl. Unfortunately this test is not accurate because of the individual differences that occur in the rate of the heartbeat. More recently an attempt has been made to use X ray in the *ossification-of-bones test*. This is based on the knowledge that comparable bones ossify earlier in girls than in boys. But, once again, individual variations from one fetus to another make this test far from accurate. At the present time, any attempt to predict sex is no more accurate than guessing.

Controlling Sex.—For centuries, there have been countless theories about how sex can be controlled in the human offspring. An early superstition was that if a man went to bed on his wedding night wearing his boots, a boy would be conceived. Some theories stress that fertilization just after menstruation is supposed to result in the female offspring. Others claimed that the food eaten by the mother during pregnancy would determine the sex of the child. A girl child, it was believed, could be produced if the mother ate large amounts of sugar. The month of the year when conception occurred was likewise supposed to determine sex. Recent experimental investigations have disproved all the old theories and have, at last, given accurate scientific data regarding a problem that man has striven for years to solve.

X and Y Chromosomes.—Discovery of sex chromosomes has shown that the factors that actually determine sex are internal, and that the sex

of the fertilized ovum is fixed at the time of fertilization. In every species in which sexual reproduction occurs, one of the sexes has a pair of chromosomes represented by a single member like the other chromosomes and one that is different. In the human being, the unmatched chromosomes appear in the male, while in the female all pairs are matched. Sex is

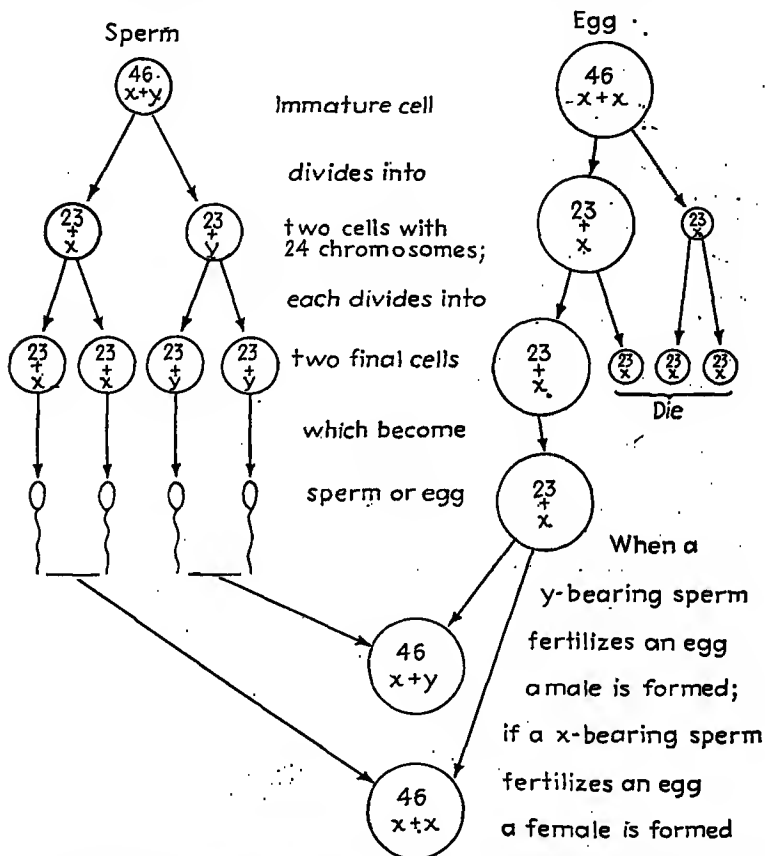


FIG. 12.—Maturation of the sperm (on the left) and the egg (on the right), and their fusion to form a male or female individual. The 48 chromosomes of each immature cell are indicated as 46 plus $x - y$ in the male, or 46 plus $x - x$ in the female. (From M. S. Gilbert, *Biography of the unborn*. Williams & Wilkins, 1939.)

determined by the presence or absence of a pair of unmatched chromosomes, the X and Y chromosome, in the matured spermatozoon. This is illustrated in Fig. 12, which shows how male and female chromosomes combine to determine the sex of the new offspring.

When the sperm cell divides during the maturation process, half the spermatozoa thus formed contain an X or matched chromosome and half an unmatched or Y chromosome, the latter differing somewhat in size

and shape from the matched chromosomes. There are thus, at the time of maturation of the spermatozoon, 23 pairs of matched chromosomes and an extra pair made up of one X and one Y chromosome. When division occurs, there are, as a result, two kinds of spermatozoa, one with 23 matched or X chromosomes and one unmatched or Y chromosome. The second type contains 24 matched or X chromosomes. These two kinds of sperm cells occur in equal numbers. In the case of the female ova, on the other hand, all have an equal number of matched chromosomes.

When the ovum is fertilized by the spermatozoon with the Y chromosome, a male offspring results; when fertilized by a spermatozoon with all X chromosomes, on the other hand, the result will be a female offspring. Whether the ovum will combine with a spermatozoon with a matched or an unmatched chromosome, no one can tell ahead of time, and no one can influence the combination in any way. After fertilization has occurred, nothing can be done to change the sex of the fertilized cell. Determination of sex is therefore obviously a matter of chance. It is not something that can be controlled or influenced by human endeavor.

Statistics show that there is an excess of male births in the ratio of 106 to 100, or, that there are 106 boys born to every 100 girls. This excess of boys is seen also in abortions and premature births. The chances of being a boy are thus 6 per cent greater than those of being a girl. What is responsible for the larger percentage of boys than girls is still unknown. It has been explained in many ways, the most credible explanation being based on the belief that because the 23 X and 1 Y chromosome spermatozoon (the one that produces a male offspring) is slightly lighter and hence swifter in movement than the 24 X chromosome spermatozoon (the type that produces female offspring), it is likely to reach the ovum sooner. As a result, the chances of producing a male offspring are slightly greater than the chances of producing a female one.

PRENATAL NUTRITION

Until the fertilized ovum becomes attached to the wall of the uterus, it is nourished by a small amount of yolk within the ovum itself. This is soon used up, but not before the ovum implants itself in the wall of the uterus. The ovum then absorbs water and some nutritive substances from the wall of the uterus in which it has become embedded.

When the fetal heart begins to beat, the fetus depends entirely upon the mother for nourishment. It is a parasite in that it feeds upon another body within giving anything in return. Food and oxygen pass from the mother's system to that of the fetus, through the pure blood from the placenta that comes through the umbilical vein. The waste products pass from the fetal to the maternal blood through the two umbilical arteries.

NEURAL DEVELOPMENT

Development of the nervous system proceeds at a rapid rate throughout the entire prenatal period. The beginnings of the nervous structures of the body are apparent as early as the *period of the ovum*, the first two weeks following fertilization. In the beginning of the *period of the embryo*, the period extending from the end of the second week to the end of the second month, the first groove in the ectoderm folds inward to form the neural tube, the lower part of which develops, eventually, into the spinal cord and the upper part into the brain.

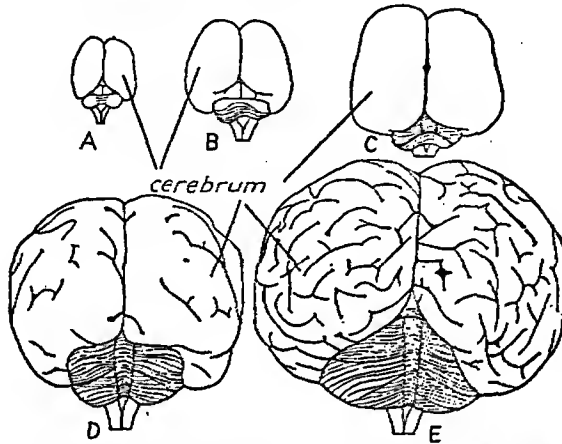


FIG. 13.—Development of the human brain. Views of the brains of successively older fetuses, seen from the top and back of the brain. Note the increase in the size of the cerebrum and the formation of complex grooves and ridges on its surface. (A) Third month. (B) Fourth month. (C) Fifth month. (D) Seventh month. (E) Ninth month. (After Retzius and Broman, from M. S. Gilbert, *Biography of the unborn*. Williams & Wilkins, 1939.)

Brain.—By the fifth week, the principal structures of the brain, the cerebellum, medulla, midbrain, and endbrain, can be distinguished at the top of the neural tube. These higher brain centers do not, however, function effectively until the time of birth. During the second month, neurones appear in the form of neuroblasts, or cells without nervous extensions. By the third month, short, threadlike prolongations appear. Later, they become the axons and dendrites of the neurones. By the fifth prenatal month, it is believed, the complete number of neurones to be possessed by the mature individual is present, though many of them are still in a very immature state of development. How well developed the human brain is at different periods during prenatal development is illustrated in Fig. 13.

From the fifth month to the end of the prenatal period, development of the nervous structures consists of extension of the axons and dendrites,

modifications of the synapses, and acquisition of a myelin sheath or covering. This makes possible the establishment of patterns and systems of organization of the paths, some of which are functionally mature before birth, some at birth, and others not until after birth. The earliest to mature are the ones involved in the fundamental reflexes and vegetative control, as in the case of the heartbeat. The maturing occurs first in the spinal cord, then in the midbrain, and last, in the various regions of the cerebral cortex.

SENSE ORGAN DEVELOPMENT

It is almost impossible to study and test the senses of the fetus. For that reason, data concerning them must come from a study of the developmental condition of the senses at birth. Even after the fetus is removed from the mother's body, the senses are hard to study because the responses made are so restricted that they are difficult to interpret.

In the uterus, sensations are probably not experienced, owing to the constant conditions within the uterus which would make stimulation of the sense cells impossible. For example, the amniotic fluid in the mouth and nostrils would prevent the reception of taste and smell stimuli. As temperature and light conditions are constant in the uterus, stimulation of these senses is impossible until after birth.

A brief summary of the state of development of the different sensations during the prenatal period brings out the following facts:

1. *Cutaneous Sensitivity*.—This begins in the oral-nasal region, involving the mucous membrane of the nostrils and the red of the lips. Skin sensitivity develops by spreading over the head region and then progressively over the whole surface of the body.

2. *Temperature*.—In prematurely born infants, the temperature sense is much the same as in normal, full-term infants. They react less strongly to stimuli warmer than the body than to stimuli cooler than the body at the time the stimuli are applied.

3. *Pain*.—The pain sense is little developed during the prenatal period. Even when a prematurely born infant is stimulated until blood comes, little or no response is made.

4. *Taste*.—The taste buds begin to develop during the third fetal month and are more widely distributed in fetal than in adult life. They are to be found not only on the tongue but also in the hard palate, the tonsils, and parts of the esophagus. Later they are limited to the tongue. Even though the taste mechanism is present before birth, there is no adequate stimulation of this sense until after birth. In prematurely born infants, sweet is distinguished from salt, sour, and bitter.

5. *Smell*.—So long as the nasal cavity is filled with amniotic fluid, as it is during the entire prenatal period, there can be no adequate olfac-

tory stimulation, and olfaction does not occur in its normal form until the nasal cavity is filled with air. Smell reactions in the premature, however, show that the smell mechanism is well developed.

6. *Hearing*.—The auditory mechanism is well enough developed that it could function before birth, but the infant remains partially deaf until the Eustachian tube of the ear is opened and the gelatinous liquid of the fetal middle ear is drained out. This occurs shortly after birth, owing to breathing and crying which help to drain the passage. The fetus, as is true of the newborn, is deaf to sounds of normal intensity. Only strong sounds that can pass through these mechanical blocks can bring forth reactions. In the experiment of Sontag and Wallace (1935), referred to earlier in the chapter, it was found that responses to sound stimuli, produced by doorbells, buzzers, and wooden knockers struck against a disk attached to the mother's abdomen, could be detected at the beginning of the thirty-first week of intra-uterine life. The responses increased in magnitude as the fetus neared full term.

7. *Vision*.—The eye begins to develop during the second or third week of embryonic development. No stimulation, however, is possible before birth. In the prematurely born, specific reactions to light and pupillary reflexes occur. Eyelid reactions and eye movements occur before birth.

MULTIPLE BIRTHS

Multiple births, or the birth of two or more offspring within a few days of one another, are the result of an asymmetrical cell division, or of several simultaneous fertilizations. When the fertilized ovum divides, early in the prenatal period, cells may split away from each other, and each group thus formed grows independently of the others. In the case of the Dionne quintuplets, for example, there was evidence to show that six embryos started an independent development as a result of cell division in the fertilized ovum. One of these aborted, while five reached maturity.

The larger the number of offspring born at the same time, the rarer is the occurrence. In the table given below are the estimated relative frequencies of the different types of multiple births:

TABLE III.—ESTIMATED RELATIVE FREQUENCIES OF MULTIPLE BIRTHS

Twins	once in every 8,525 births
Triplets	once in every 7,225 births
Quadruplets	once in every 614,125 births
Quintuplets	once in every 52,200,625 births
Sextuplets	once in every 4,437,053,125 births

Twins.—It was formerly believed that all twins (two individuals born at the same time) were of the same type. Recent scientific studies have revealed that there are two distinctly different types of twins. The first type, the *identical*, or uniovular, twins, come from a single ovum

fertilized by a single sperm; the second type, the *nonidentical*, biovular, or fraternal twins, are the product of two ova fertilized simultaneously. Nonidentical twins occur more frequently than identical twins, though there are no statistics available to show exactly what the difference in frequency is. It is estimated that approximately one-fourth of all twins are of the one-egg type. Figure 14 illustrates the two types of twins.

Identical Twins.—When one ovum is fertilized by one spermatozoon, it occasionally happens that at the time of the first division of the cell,

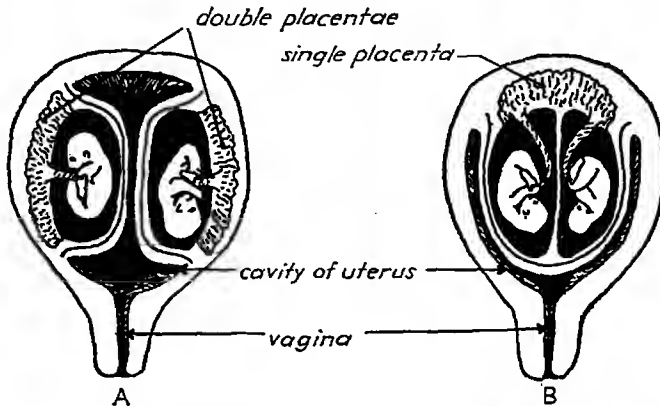


FIG. 14.—Two possible relations of twins within the uterus. A, False, or fraternal, twins, with separate placentae and occupying separate walls of the uterus. B, True, or identical, twins, having one placenta in common, and embedded in one place in the uterine wall. (After Corning, from M. S. Gilbert, *Biography of the unborn*. Williams & Wilkins, 1939.)

when the ovum divides to form two, these new cells separate instead of remaining together. Why this division takes place, no one knows. The result is that each part develops into a complete individual. Twins formed thus are called “identical” because they have exactly the same assortment of genes. For that reason, they resemble one another very closely in all their hereditary traits. They have the closest degree of kinship possible for two distinctly separated individuals. They are always of the same sex; they have one placenta and are enclosed in one chorion coat.

Nonidentical Twins.—In the human female, only one ovum normally matures at a time and thus only one child develops. Occasionally, two or more ova may develop simultaneously and be fertilized at the same time. The individuals who develop from these two ova are known as *fraternal*, *biovular*, or *nonidentical* twins. The name “nonidentical” suggests lack of similarity in the physical and mental make-up of the twins. The explanation of this fact is that when the chromosomes of the two ova divide, the grouping is not likely to be the same for both. One ovum may receive a preponderance of chromosomes from the maternal

grandfather and the other, from the maternal grandmother. In addition to that, both ova are fertilized by individual spermatozoa, each with its own assortment of chromosomes. The offspring, as a result, are certain to be unlike in many traits, as is true of ordinary brothers and sisters. Nonidentical twins may be of the same or of opposite sexes. During the prenatal period, two distinct placentas are formed, and each ovum thus has its own prenatal environment. Nonidentical twins are not really twins, but rather are simultaneous pregnancies.

MATERNAL IMPRESSIONS

From the time of primitive man, traditions have been widely accepted by educated as well as ignorant members of society which hold that the mother, during the pregnancy period, can mark her baby by the thoughts, emotions, or experiences she has at that time. This "marking" of the baby was believed to result from "thought transference" or some mysterious nervous relationship between mother and fetus. There are many accounts of terrors due to black cats or burglars or overindulgence in certain favorite foods told as conclusive proof of the cause of birthmarks and other forms of disfiguration on the infant's body.

Our present-day medical knowledge of the relationship between the body of the fetus and that of the mother furnishes us with evidence to disprove these old superstitions. There are three distinct lines of evidence to show that maternal impressions cannot cause abnormalities. These are: (1) the fact that abnormalities usually come after the first two months of prenatal development, when the embryo's body is fairly well formed and, as a result, less liable to be deformed; (2) the fact that the same types of abnormalities are found in most of the lower animals where, because of the low level of development of the nervous system, maternal impressions do not exist; and (3) the fact that there is no direct connection between the mother and fetus, and hence, the mental, emotional, or nervous condition of the mother can have no direct effect whatever on the fetus.

Causes of Abnormalities.—Abnormalities in the human fetus are brought about by two types of causes, *intrinsic* and *extrinsic*. The intrinsic causes are due to inheritance or to disturbance or disease of one or more of the endocrine glands. Extra fingers or toes, for example, are caused by inheritance, while giantism, dwarfism, and cretinism (mental deficiency accompanied by physical deformities) result from abnormal functioning of the endocrine glands, especially the thyroid and pituitary glands. The extrinsic causes include any severe disturbance in the environment of the embryo or fetus due to malfunctioning of the placenta. Deficiency of vitamins or minerals from the mother's blood and poisonous substances from an oversupply of endocrine secretions,

excessive use of drugs or alcohol, or from venereal diseases are all illustrations of extrinsic factors. These affect the fetus indirectly by making proper nourishment of it impossible.

FACTORS INFLUENCING PRENATAL DEVELOPMENT

There are many popular superstitions, such as the maternal impressions discussed above, concerning the factors that are believed to influence prenatal development. But unfortunately there has been little scientific research along these lines. It is generally believed that variations in the diet, health, and glandular secretions of the mother during pregnancy, which influence the chemical condition of her blood stream, have a marked effect on the developing fetus. At the present time, information regarding these influences is very slight. It is difficult, and at times impossible, to tell whether an effect produced comes from one factor or another.

Most information available comes from the abnormal development of the fetus itself or from experimentally induced structural changes in lower animals. It is impossible to study the normal human fetus experimentally by changing environments to see what effect these changes have on the development of the fetus. This technique has been used with animal subjects experimentally to produce *monsters* by the use of changed environmental conditions involving the use of cold water, chemicals, insufficient oxygen, ultraviolet rays, etc. Two-headed monsters among tadpoles can be produced, for example, through the use of chemical or mechanical stimuli. By adding magnesium chloride to water, the eyes of minnows can be displaced. Changed environmental conditions change the rate of development, thus altering the balance of growth among the different parts of the organism.

In the case of human beings, the germ cell, whether male or female, may be injured before conception, and the offspring resulting from it will thus be affected. Nature takes care of many of these abnormal cases by miscarriages or stillbirths. During pregnancy, however, a healthy fetus, made up of the union of a healthy ovum and healthy spermatozoon, may be affected adversely by unfavorable factors in the prenatal environment. The effect on the developing fetus will be either retardation in development or development of an abnormal type.

Experimental studies have shown that the period in the development of the fetus at which the agent is introduced, rather than the agent itself, is the determining influence in producing abnormalities. The rate of development, when changed by some foreign agent, alters the course of growth in the different parts of the organism and abnormalities result. In the early part of the prenatal development, during the periods of the ovum and of the embryo, any disturbance to the normal course of development is more serious than later on because, in these early stages,

the different parts of the human organism are taking form. After they have appeared, interferences to normal development are less serious.

The most important factors influencing the prenatal development of the human infant are:

1. Food.—As the growth of the fetus is most rapid during the latter part of pregnancy, the mother's food is most important at that time and should be selected to fill the requirements of the fetus. The fetus needs proteins for tissue building and repair, fats to form tissue fats and fuel for the body as well as a surplus to store in body fat as a reserve, and carbohydrates for strength and energy.

When the mother is seriously malnourished or undernourished, so that the fetus does not receive from the maternal blood stream the needed elements of nourishment, prenatal growth is hindered. Malnutrition, resulting in vitamin deficiency, is more serious than insufficient food. The effect is either some physical abnormality such as rickets, nervous instability, general physical weakness, or mental deficiency of a more or less pronounced sort.

2. Diseases.—Any diseased condition of the mother that affects her general metabolism will influence to a certain extent the development of the fetus. The diseases believed to be the most serious are: (a) *Syphilis*, which often causes miscarriages, stillbirth, congenital mental deficiency, blindness, or deafness. Toxins of syphilis in the blood of either parent may injure parts of the germ cells before fertilization, or the fetus may become infected before or at the time of birth. (b) *Gonorrhea*, which may infect the baby's eyes when it passes through the birth canal and thus cause "congenital blindness." Because of this, most states have laws requiring the use of some prophylactic for all babies, usually one drop of one per cent solution of silver nitrate in the eyes of the newborn. (c) *Endocrine disorders*, which are thought to have pronounced influence on the development of the fetus, but medical information of a reliable sort is still very scanty. When there is a thyroid deficiency, the younger the fetus the more pronounced the symptoms of abnormal development. Bones and cartilage, except the skull, fail to develop; the abdomen protrudes and becomes large and flabby; the skin is rough and coarse; the hair is shaggy; and the intellectual development is subnormal. A pronounced condition of thyroid deficiency is known as "cretinism." (d) Prolonged or *wasting* diseases of the mother, such as tuberculosis and diabetes, have effects on the fetus similar to those of malnutrition; (e) *Toxins* or poisons in the mother's blood, coming from lead or phosphorus from certain occupations, such as paint and pottery manufacturing, and bacteria from certain diseases are known to influence detrimentally the developing fetus. Lead poisoning causes abortions, deaf-mutes, and other deformities. (f) *X ray* and *radium*, when used in too small amounts

to end the growth of an animal fetus, nevertheless bring about changes in the offspring and affect the succeeding generation. As no experimental studies have been made on the human fetus, little is known about their effects except that pregnancy can be ended by X-ray treatment.

3. Alcohol.—Because of the present social tendency for women to drink, there are many theories but little scientific evidence regarding the effect of alcohol on the offspring. Even if not used by the mother, the male germ cell may have been weakened by alcohol before fertilization occurs. This in turn causes mental deficiency or nervous instability in the offspring.

Experiments carried out on animals give a clue as to what to expect when the fetus is subjected, in one way or another, to the influence of alcohol. Arlitt (1911) fed alcohol to male and female rats once a day for periods varying from 16 days to 6 months. She found a marked retardation in the rate of growth of the rats as compared with that of normal rats of the same age. The effect on growth was found to extend to the third and fourth generations of the rats thus fed. Alcohol was also found to produce partial or complete sterility, depending upon the size of the dose given. When conception occurred, there was an increase in the number of stillbirths and infant mortality.

Stockard (1931) reports an experiment in which pregnant guinea pigs were treated with fumes of 95 per cent ethyl alcohol. The animals subjected to this treatment showed mortality among their offspring at the rate of 195 against 100, as compared with a control group not subjected to this treatment. The prenatal deaths among the offspring of the treated parents were $2\frac{2}{3}$ times greater than the postnatal deaths, 70.3 per cent against 29.7 per cent. The second generation of offspring of the guinea pigs treated with alcohol fumes likewise showed a high prenatal mortality.

In the human being, owing to the fact that the fetus obtains nourishment from the maternal blood stream, it is obvious that the constant introduction into the blood stream of chemical substances which impose a burden of accommodation on the physiological mechanism of the mother must, in one way or another, impose a burden on the fetus. When the limits of accommodation are exceeded, there are certain "danger signals," such as nervousness, wakefulness, or irregular heart action, which show that as the mother is being affected detrimentally, the fetus is likewise. Even a moderate intake of alcohol is apparent in minimal quantities in the milk secretion of the mother.

4. Tobacco.—Tobacco contains nicotine, a powerful narcotic poison. When inhaled, its effects are more injurious than in ordinary smoking because of the disturbance of blood pressure and heart action. General resistance to infections is lowered, especially in the mouth and throat.

In animals, such as the cow and cat, nicotine has been found to lessen milk secretion, though there is at present no definite scientific information as to what effect it has on the human mother or offspring.

5. Order of Birth.—The law of primogeniture, favoring the first-born in accession to title, property, and wealth, is based on the supposed superiority of the first-born. Many studies have been made to discover the relative effect of order of birth, or position in the family, on the intelligence of the offspring. Stated in another way, the question is, "Will the first-born have greater chances of being the brightest than will the second, third, or later-born children?"

Some scientific studies show a definite tendency for the intelligence quotient to increase progressively from the first-born to the later born, at least as far as the eighth-born child. Willis (1924) compared 219 pairs of first- and second-born children and noted a median intelligence quotient of the elder siblings to be 93.05 as compared with 99.14 of the younger siblings. In a study of 5,928 pairs of siblings, Steckel (1931) reported an increase in intelligence quotient scores with increase in order of birth as far as the eighth born. Jones and Hsiao (1928), on the other hand, failed to discover any significant difference in intelligence quotient scores between older and younger siblings in a group of isolated New England communities.

Genius, on the contrary, occurs more frequently among first-born than among later-born siblings. Cattell (1921) found a disproportionate frequency of the first-born among the American men of science. In *Who's who*, Ogburn (1927) reports that the eldest child is most frequently represented, the youngest next most frequently, and the middle children least frequently. Likewise, Terman (1925), in his study of child genius, found a disproportionate frequency of geniuses among the first-born.

6. Age of Parents.—Whether the age of the parents has any influence on the development of the fetus has never been proved scientifically. Studies relating to the age of the parents and the intelligence of the child show that older parents have more intelligent children than have younger parents. This, however, may be due to the social level of the parent and not to age. In the higher social classes, where the average intelligence quotient is highest among the children, there is a tendency to marry later because of the long period of training necessary to prepare both men and women for their life occupations.

Steckel (1929) reported that children born of young parents were less intelligent than children born of more mature parents. Below the ages of 26 to 28 years for mothers and 30 to 32 years for fathers, the mean intelligence rating of the children decreased. Terman (1925) found that the average age of fathers at the time of birth of superior children was 33.63, while the average age of their mothers was 29.01 years.

The relationship between age of parents and genius was investigated by Ellis (1904), who discovered that in the case of 299 eminent men, the average age of the fathers at the time of the birth of the sons who later became eminent was 37.1 years, while that of the mothers was 31.2 years. Galton (1914) found the average age of the fathers of eminent men to be 36.0 years, and Yoder (1894) reports 37.78 for the fathers and 29.8 for the mothers.

When a difference in the age of parents exists, what effect has it on the intelligence of the children? Ellis (1904) reported that a mean disparity in age of 7.17 years existed in the case of the parents of his British geniuses. Stockel (1929), on the other hand, found that parents whose ages approached each other tended to have more intelligent children than those between whom a large age difference existed. Data available on this subject are too limited for definite conclusions, but there are indications that there is a tendency for parents of approximately the same age to have more intelligent children than there is for those who are widely different in age.

7. Emotional Experiences of Mother.—There are many traditions relating to the effect of the mother's emotional experiences on the growth of the fetus. Some of them go so far as to hold that, if the prenatal period is predominantly a happy one for the mother, the disposition of the baby will be made cheerful and happy. A prenatal period, on the other hand, marked by emotional disturbances, fears, and worries will, it is believed, result in a morbid, sad, introverted personality for the baby. Too little scientific knowledge relating to this problem is available at the present to be conclusive. If the emotional experiences of the mother influence the developing fetus in any way, it is through the glandular changes which take place in her body during the prenatal period.

8. Month of Birth.—Whether or not the month of birth has any influence on the developing fetus, has been the subject of a certain amount of speculation as well as scientific investigation. Blonsky (1929) contends that the month in which a child is born has some influence on his mental as well as on his general bodily development. This, he believes, is shown by the fact that larger numbers of repeaters in the schools are born in late fall and winter than at other seasons, with the months of October to December producing the largest numbers. The smallest number of repeaters was found to come in the case of children born in March, April, and May. Likewise, the mean intelligence quotient was lowest for the children born during the late fall or winter months and the highest for children born in the spring.

Pintner (1931) studied 4925 school children of all ages to test Blonsky's contention that the month of the year in which the child is born has some influence on his development. He found no real relationship between

the intelligence quotient score and the month of birth. The winter months of February and March were slightly less favorable than the other months, but the differences were too small to be significant. Working with Forlano (1934), Pintner studied the birth months of eminent men taken from samples from *Who's who in America*, *American men of science*, and other similar records. In all, 25,166 cases were studied. They found that the largest percentage of eminent men were born in October. When seasons instead of individual months were studied, the summer seasons, including July, August, and September, produced the largest percentage of eminent men, while the lowest percentage of eminent men were born in the spring, a finding contradictory to that of Blonsky. In all cases, the differences were very small.

More recently, Pintner and Maller (1937) analyzed intelligence-quotient scores in relation to birth month for three ethnic groups, Italians, Jews, and Negroes. In each case, small but statistically significant differences were found in favor of those born in the late spring, summer, or fall. Fialkin and Beckman (1938), in a study of male adults, found a difference of less than 3 I.Q. points between those born in winter and those born in the months of warmer temperature. This difference was in favor of those born in the spring. Peterson (1936) reported to the members of the National Academy of Science a study based on statistical evidence from *Who's who in America* and similar publications. His report covered 25,000 cases, and the results showed that individuals conceived during the first half of the year are likely to be more exceptional in their mental make-up than are those conceived during the last half.

CHAPTER IV

THE NEWBORN INFANT

Infancy, or the period of the newborn, is a plateau stage in development. At this time, the infant must make adjustments to a completely new environment, outside of the mother's body. During the first few days after birth, the infant usually loses weight. Gradually, toward the end of the first week, as he becomes adjusted to his new environment, the infant starts to regain the weight lost immediately after birth, and this is usually accomplished by the end of the second week. Changes during this period are comparatively slight; no marked development occurs until the weight lost after birth has been regained.

Period of the Newborn.—According to medical standards, the period of the newborn extends from birth to the end of the second week, or until the navel is healed. Infancy is generally subdivided into two periods the *period of the parturient* and the *period of the neonate*. The *period of the parturient* consists of the first fifteen to thirty minutes of life, including the time during and immediately after parturition or birth. It covers the time when the infant ceases to be a parasite, with the cutting of the umbilical cord, and becomes for the first time, a separate, distinct, and independent individual. The *period of the neonate* covers the remainder of the infancy period and is characterized by the making of adjustments essential to a life free from the protections of the intra-uterine environment. (The term "neonate" is derived from the Greek word, "Neos," meaning "new," and the Latin verb, "nascor," meaning "to be born.")

Before making a survey of the outstanding characteristics of the newborn, it must be understood that in different infants the state of development at birth differs greatly. The greatest differences are to be found in abnormal cases and premature births. At birth, many infants show capacities which in others do not develop for weeks or months. For that reason, one is justified in assuming that entrance into the world does not signify the same starting point of development for all human beings. It is only logical to suppose that, as the premature infant is smaller than the mature or postmature one, his mental development is also below the average. The description of the newborn, given in this chapter, will therefore, refer only to the normal, 10-lunar-month infant. What scientific knowledge there is of individual variations will be emphasized.

SCIENTIFIC PROCEDURES IN STUDYING THE NEWBORN

As the interest centered on the arrival of a baby in any household is always great, one could justifiably assume that the newborn infant had been carefully and systematically studied from every possible angle. This, however, is not the case. While interest of a sentimental sort has existed, attempts on the part of the psychologist to make impersonal, objective studies of the human being at this age have often led to opposition from both parents and physicians, but in recent years a number of scientific studies of the newborn have been made, first in Germany and, more recently, here in America. These have been limited in scope and have emphasized only a few aspects of the birth equipment, such as the physical and sensory development. Little attention has been given to a study of the mental and emotional development.

Baby Biographies.—Among the pioneer studies of the newborn are many biographical studies based on the observations of single infants. These followed closely the pattern set by Preyer (1888) in his *Mind of the child*. The main emphasis in these studies was on the sensory and reflex development present at birth. Most of the biographies were made from records kept by parents or close relatives, and the tendency to interpret findings or to read meanings into the infant's behavior militated against their scientific accuracy.

Group Studies.—The first group studies of the newborn were made in Germany by Kussmaul, Genzmer, and Kroner. These were carried out in maternity hospitals and were limited almost exclusively to an investigation of the state of development of the infant's sensory equipment at birth. Later, as an outgrowth of animal psychology, a number of observations of groups of newborn infants were made to determine birth equipment along lines other than those of sensory development. To increase the scientific accuracy, 24-hour observations have been made in experimental nursery laboratories by trained psychologists.

In America, one of the earliest of the group studies, modeled along the lines of the German investigations was that of Peterson and Rainey (1910). Over 1,000 newborn infants were examined by them to determine the sensory equipment present at birth. J. B. Watson (1925a) at the Phipps Clinic of Johns Hopkins Hospital turned his attention to the study of reflexes, the so-called "instinctive equipment" and emotional development present at birth. Sherman (1924) and Blanton (1917) carried out experiments similar to those of Watson.

Continuous Observations.—Recently, a few observations repeated over a continuous period of time, with minute-to-minute records and carefully controlled environmental conditions, have been made. In Vienna, Bühler, Hetzer, and Tudor-Hart (1927) noted continuously, 24

hours a day and under controlled conditions, the activities of 69 babies for one month. At The Ohio State University, Pratt and his assistants (1930) observed 25 babies of two weeks of age or less, under conditions in which the external stimuli were kept quite rigorously constant during periods of 5, 10, and 15 minutes in length. The infants were observed in an experimental cabinet (see Fig. 15), lighted from within, soundproof,

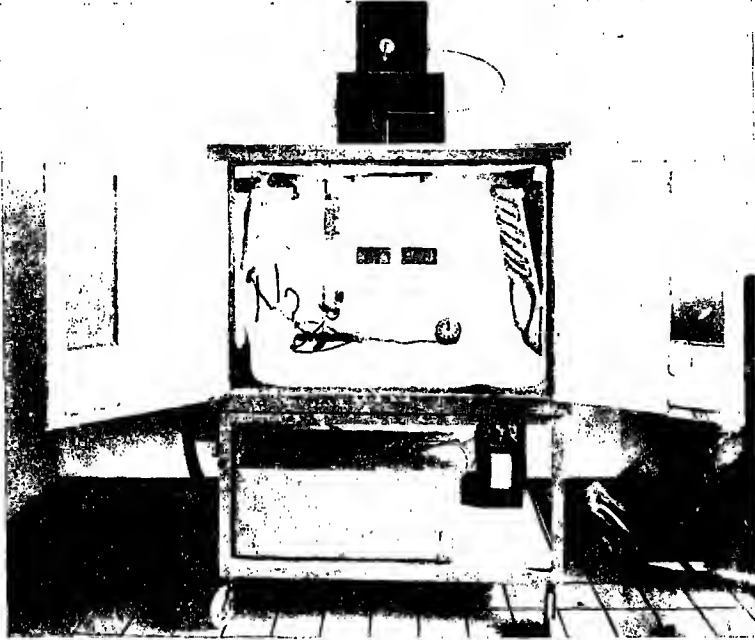


FIG. 15.—The experimental cabinet used in infant research. (Courtesy of F. C. Dockeray of The Ohio State University.)

with regulated temperature and humidity, and equipped with a stabilimeter platform on which all gross bodily movements were recorded. This was done by placing the platform on ball bearings so that every time the infant moved, the platform wobbled. The movements were then recorded on a roll of paper moving at a constant speed. Irwin (1930), following along the same general lines as Pratt, observed continuously four infants from birth to ten days of age.

In the following pages of this chapter, a cross-sectional view of the infant will be given to show what the birth equipment of the human being is. From this inventory, the reader may see how limited the equipment is at the beginning of the postnatal period and how much development must take place after birth.

STAGE OF PHYSICAL DEVELOPMENT AT BIRTH

The average weight of the newborn is 7.5 pounds and the average length, 19.5 inches. Weight ranges from 3 to 16 pounds, and length,

from approximately 17 to 21 inches. Montague and Hollingworth (1914) found that the average male infants they studied were slightly larger than the average female infants in all anatomical measurements, but these differences were not great. Variability in weight and length is also dependent to a greater or less extent upon variations in prenatal development, especially as it is influenced by prenatal feeding.

Physical Proportions.—The physical proportions of the infant differ greatly from those of the adult (refer to Fig. 3). The infant's head is about one-fourth of the entire body length, while in the adult, it is one-seventh. The part of the head where the greatest disproportion exists is in the area above the eyes, the cranial region. In the infant, the ratio between the cranium and face is 8:1, while in the adult it is 1:2. The infant's face appears to be broad and short because of lack of teeth, the undeveloped condition of the jaws, and the flatness of the nose. The arms, legs, and trunk are small in relation to the head. The abdominal region of the trunk is large and bulging, while the shoulders are narrow, just the opposite of the adult proportions.

The relative proportions of the infants' and adults' bodies is emphasized by the following ratios:

TABLE IV.—RELATIVE PROPORTIONS OF INFANT AND ADULT BODIES

Head of infant:head of adult::1:2.
Trunk of infant:trunk of adult::1:3
Arms of infant:arms of adult::1:4
Legs of infant:legs of adult::1:5

Infantile Features.—The eyes of the newborn are bluish gray, but this color gradually changes to whatever the permanent color may be. Though almost mature in size, they are uncontrolled in motion and roll in a meaningless fashion without relation to one another. The tear glands are inactive, and therefore crying is not accompanied by a flow of tears. The neck is so short that it scarcely exists, and the skin covering it lies in deep folds or creases. A heavy growth of fine-textured hair often covers the head.

The muscles of the newborn are small, soft, and uncontrolled, with those of the legs and neck less developed than those of the arms and hands. The bones are composed chiefly of cartilage or gristle and consequently are soft and flexible. The flesh is firm and elastic, while the skin is soft, deep pink in color, and often blotchy, especially in the head region. Sometimes a soft, downy growth of hair is found on the body, mostly on the back, but this soon disappears.

Physiological Functions.—Before birth, as was pointed out in Chap. III, the human being is a parasite, totally dependent upon its mother for existence. Respiration, nutrition, and elimination are carried on through interchanges in the membranes of the placenta. The birth cry brings

about an inflation of the lungs which, in turn, starts up respiration. When the infant is hungry, or when the lips are touched, reflex sucking movements occur. Within a few hours after birth, elimination of waste products from the infant's body takes place. Thus it is apparent that these three important physiological functions of the human being are established within a few hours after birth.

The physiological functions of the infant differ greatly from those of the adult. The blood contains fewer red corpuscles and more white corpuscles than in the adult, and hence the infant's resistance to disease is poor. The pulse rate ranges from 130 to 150 beats a minute but drops to an average of 118 several days after birth; the adult rate is 70. The respiration rate is nearly twice as great as in the adult, ranging from 40 to 45 a minute, in contrast with the average adult rate of 18. The heart, compared with the arteries, is small, and must therefore beat more rapidly to maintain normal blood pressure. In a healthy infant, the temperature is higher and more variable than in an adult and is maintained between 98.2 and 99.0°F.

SLEEP OF THE NEWBORN

Sleep is part of the infant's behavior equipment which is present in a completely developed form from the time of birth. The newborn sleeps or dozes from 15 to 20 hours daily, contrasted with 8 hours or less in the case of adults. The percentage of sleeping time in 24 hours has been investigated by Bühler and Pratt, Nelson, and Sun. Bühler (1930) reports that 80 per cent of the 24 hours is spent in sleep, compared with 49 per cent at the age of one year. Pratt, Nelson, and Sun (1930) found that on the day of birth the infants were asleep 64 per cent of the time they were under observation; on the first day after birth, 84 per cent of the time; and on the fourth day, 68 per cent.

Length of Sleep Periods.—The sleep of the infant is broken by short waking periods which occur on the average of every two hours. Bühler (1930) said that the longest period of uninterrupted sleep she observed in newborn infants was 220 minutes. The waking periods are generally fewer and shorter during the night than during the day. Gradually, the length of the unbroken sleep periods increases, so that by the end of the second month the baby can sleep for five or six hours without waking. Infants generally stay awake for the first two hours after birth. This is probably due to the medical attention they receive at that time.

The infant is wakened by hunger, pain, and internal sources of discomfort. The only environmental stimuli that will disturb him are changes in temperature and very loud noises. In contrast with older children, the infant sleeps more lightly and can be awakened more quickly and easily. He is able, also, to fall asleep more readily. The sleep of

the infant reaches its greatest depth during the first hour, while during the second hour the sleep is lighter and can be broken more easily.

Sleep Postures.—The characteristic method of falling asleep and awakening has been described by Bühler (1930) as follows: "The newborn child twitches in that moment when he falls asleep. . . . Awakening, the newborn child throws his head backward, stretches his arms and body" (p. 119). When placed in a prone position, the posture of the newborn is similar to that of the fetus during intra-uterine life. This was reported by Shirley (1931a) to be the case in all the 24 infants studied by her but was found to be outgrown generally by the end of the first month owing to the tonus of the baby's musculature. Movements during sleep increase with age throughout the first two weeks, as is true of the waking period. The infant often smiles during sleep. More variations in sleep posture from one infant to another occur than is generally believed.

MOTOR ACTIVITIES

At birth, the infant is not an inert bundle of skin, bones, and flesh, but is a moving, acting creature. Indeed the movements made are so rapid, varied, and diffuse that at times, especially during waking periods, it is difficult to record every movement of the infant's body. For that reason, records made by the aid of a moving-picture camera or some other technical device to assist the human eye have proved to be a valuable aid in scientific studies. The moving-picture camera method was first used by Gilmer (1933) to study infant activity and the stabilimeter method by Pratt, Nelson, and Sun (1930) at The Ohio State University (see Fig. 15).

Mass Activity and Specific Activities.—The first activities of the human infant are random, imperfect, and uncoordinated. And yet, within a period of a few years, these movements will, for the most part, be harnessed and controlled to form the basis for the coordinated skills needed in everyday life. In spite of their apparent lack of organization, the motor activities of the newborn may roughly be classed into two descriptive categories, suggested first by Irvin (1930). These are (1) *mass activity* and (2) *specific activities*.

1. *Mass activity* is activity which includes general movements of the whole body. It occurs independently of specific external stimulation, is highly uncoordinated, and is due to the neurological immaturity of the infant. Since this type of activity occurs at too rapid a rate to be observed in its entirety by the human observer, mechanical devices, such as a moving-picture camera or stabilimeter, have been used to enable the observer to get a complete and accurate picture of the movements made.

2. *Specific activities* are activities which involve certain limited areas of the body. This classification includes (a) reflexes, definite responses to specific sensory stimuli which remain unchanged with a repetition of the same stimulus, and (b) general responses, which may arise from either external or internal stimulus, and which involve larger groups of muscles than are used in reflex responses. They are less specific than the reflexes and vary with the repetition of the same stimulus. This is not true in the case of the reflexes. Because specific activities are segmental, they can be observed and recorded by an observer without the aid of moving-picture cameras or other mechanical devices.

Specific activities are in reality an outgrowth of mass activity. In the prenatal period, mass activity predominates. When one part of the body is stimulated, the whole body responds. At birth, the same is true. Even in the case of crying, the infant's entire body is active, though crying itself is limited to a small area of the body. As time goes on, and the infant's development progresses, local activities, which are more specific in form, involving only a part of the body, make their appearance.

Objections to Classification.—A few objections have been raised to Irwin's classification, described above. Gilmer (1933), after taking moving pictures of newborn infants during periods of spontaneous behavior, analyzed these pictures at different rates of speed. He contended that what Irwin called *mass activity* is actually a combination of identifiable response patterns each with its own characteristic combination of essential "elements." He maintains that there are many total bodily responses in the newborn, and that mass activity is not the only one. Dennis (1932) agrees with Gilmer's point of view and refers to "coordinate responses of many body parts" in his classification of responses of the newborn, of which *mass activity* involving crying and general unrest is only one. In spite of these objections, the classification is worth careful consideration.

1. **Mass Activity.**—When sensory stimuli are applied to any part of the body, motor activity occurs throughout the body but in a most pronounced form in the part of the body stimulated. Movements limited to one part of the body are relatively infrequent, because the immature condition of the nervous system results in a diffusion of energy when a specific stimulus is applied to one area of the body. Delman (1935), with the aid of a moving-picture camera, observed the activities of infants in response to tactual stimulation. He found that the response usually occurred first in the stimulated limb while the second response came in the collateral limb. This, he contended, indicated that some patterning in the responses was present at this early age, even though the activity was not limited to the part of the body stimulated.

Moving-picture studies made by Gilmer (1933) of four infants during the first ten days of life showed mass body movements as an accompaniment to stretching and sneezing. The specific reactions of stretching and sneezing were much the same as in adults, but they were accompanied by generalized, more-or-less-total body reactions, which is not the case in adults when the same reactions occur. The energy expended is thus great because the activity is diffused. It is estimated that the energy expended is $2\frac{1}{2}$ times as great in the infant as in the adult, when pound to pound comparisons are made. Likewise, it is estimated that in crying the infant expends three times as much energy as in sleep because of the greater amount of mass activity in the former compared with the latter activity.

Effect of Body Conditions.—Mass activity is related to the body condition of the infant. Great activity occurs during *hunger, pain, or bodily discomfort*, while limited activity is present following feeding. The most usual times for mass activity to occur are just before nursing, or between 10 P.M. and 6 A.M. It generally extends over a period of from one-half to five hours. As a rule, it increases from the first to the seventh day, and then decreases.

The following variations in infant activity have been observed by Pratt, Nelson, and Sun (1930):

1. Even when there is no external stimulus present, infants during sleep move 21 per cent of the time.
2. When awake, infants move 42 per cent of the time, and there is an increase for those awake from 37 to 86 per cent.
3. Wet infants are active 30 per cent of the time as compared with 21 per cent of the time when they are dry.
4. The most inactive infants are those who are asleep and dry.
5. When the infant is wet, more activity is aroused, and this is often followed by intermittent crying, during which every part of the body is in action.
6. Infants are active 45 per cent of the time in the morning and 55 per cent of the time in the afternoon.
7. After nursing, most infants are not only asleep but also very quiet. With the approach of feeding time, most infants are awake, restless, and "fussy." When insufficiently nourished, infants are very restless and active.

For 73 infants, Irwin (1932b) found the mean number of movements per minute to be 8.7 for *sleeping* infants as contrasted with 51.5 when the infants were awake, or about 6 times more when awake than when asleep. Mobility after *nursing* was much less than just before. The mean number of movements per minute during a 15-minute period after nursing was 17.0 as compared with 45.0 per minute during the 15 minutes preceding nursing. Hunger is doubtless the primary cause of the activity.

Effect of Environment.—Environmental conditions likewise influence the amount of activity that occurs in the infant. Weiss (1934) found that infants responded more to change in *light* stimulation than to the specific light itself. All light stimuli are disturbing and become increas-

ingly so with added intensity. Activity is greatest under minimal light stimulation and least under moderate light. The amount of activity displayed by the newborn is significantly different in darkness from that in light, with less activity in dim than in moderate light.

Auditory stimuli, Pratt (1934a) found, brought about an increase in the general activity of infants. An increase in activity follows an increase in sound intensity or a longer duration of sound stimulation, regardless of whether the infant be awake, asleep, or crying. The pitch of the stimulus affects the response least (Stubbs, 1934). Crying infants respond least to sound stimulation while awake and inactive infants respond most.

The activity of the newborn is hampered by *clothing* and covers. When these are removed, activity increases. On the other hand, there is less crying when the infant is clothed than when unclothed. The effect of clothing and covering of all sorts, such as blankets, is greatest when the physiological factors are most disturbing (Irwin and Weiss, 1934a). Bodily activity does not seem to be affected by change in *temperature* between 74 and 88° or by changes in *humidity* between 22 and 90 per cent (Pratt, 1932).

Activity in Different Body Areas.—What parts of the infant's body are most active has been studied by Irwin (1930). He found that during the 10-day period of infancy, the average percentage of movements was 4 per cent for the head, 28 per cent for the body, 21 per cent for the arms, 30 per cent for the legs and 17 per cent for sounds.

From observations ranging from 5 to 15 minutes in length, during which time no external stimuli were presented to the infants, Gatewood and Weiss (1930) reported the percentage of movements for the different parts of the infant's bodies. The data are presented in the following table.

TABLE V.—SPECIFIC MOVEMENT GROUPS

Specific Movement Groups	Centiles
Body movements.....	41.55
Head movements.....	5.12
Arm movements.....	15.15
Leg movements.....	30.25
Sounds.....	7.93
Total.....	100.00

Source: GATEWOOD, M. C., and WEISS, A. P. Race and sex differences in newborn infants. *J. genet. Psychol.*, 1930, 38, 35.

While these percentages differ slightly from those presented by Irwin, there is nevertheless an agreement in that the greatest amount of movement was found in the trunk and legs and the least in the head.

A significant difference between movements of the right and left arms was found by Stubbs and Irwin (1933) in the case of four infants observed by them. Of these four, three moved the right arm oftener than the

left. Two of the infants showed more left than right leg movement, and one more right than left. This laterality difference in the frequency of movements of arms and legs they thought might be regarded as the basis for later handedness. Similarly, Valentine and Wagner (1934) report that in the observations of 100 infants made with an apparatus which recorded the tridimensional movements of both the right and left arms, the motility of the right arm typically exceeded that of the left arm throughout the first ten days after birth.

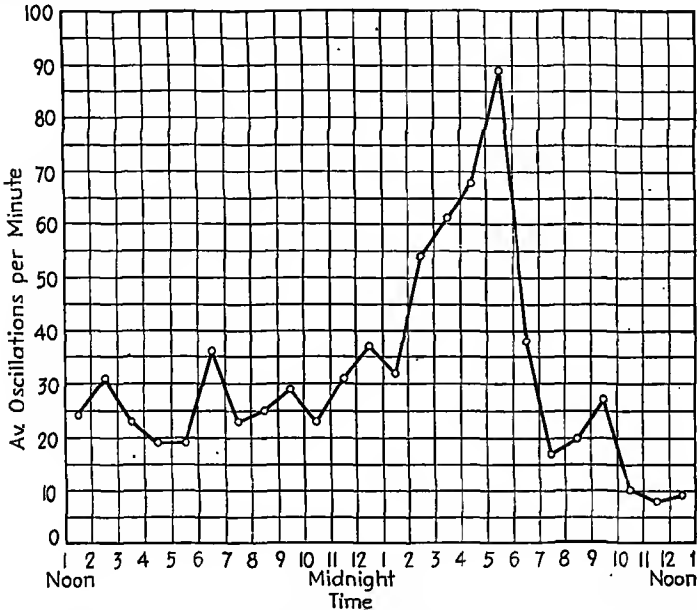


FIG. 16.—Variations in mass activity at different times of the day. (From O. C. Irwin, *The amount and nature of activities of newborn infants under constant external stimulating conditions during the first ten days of life*. *Genet. Psychol. Monogr.*, 1930, 8.)

Individual Differences.—Individual differences in mass activity are pronounced. The more complex the type of activity, the more pronounced are the individual variations. No statistically significant differences in the activity of male and female infants have been found by Pratt (1932). In this study, which included white and Negro infants of both sexes, it was found that Negro infants are less active than white infants, while male infants are slightly less active than female infants. In individual infants, however, variations in activity depending upon the time of day, occur as may be seen in Fig. 16.

2. Specific Activities.—Specific activities of the newborn have been divided into two types, (a) *reflexes* and (b) *general responses*, for convenience; the distinction is one only of degree. Studies of reflexes have been especially numerous.

a. *Reflexes*.—The outstanding reflexes present at birth or shortly afterward may be summarized as follows: pupillary corneal, conjunctival, lip, tongue, chin, breathing, Darwinian (grasping), Achilles tendon, patellar, triceps, biceps, abdominal, cremasteric plantar, Moro, sucking, visceral, flexion, knee jerk, pharyngeal, heart action, sneezing, Babinski (fanning of toes), and others. Only a few of the reflexes seem to be related to age. Changes to greater or less reaction occur between the seventeenth and the seventy-fifth hour after birth (Chancy and McGraw, 1932).

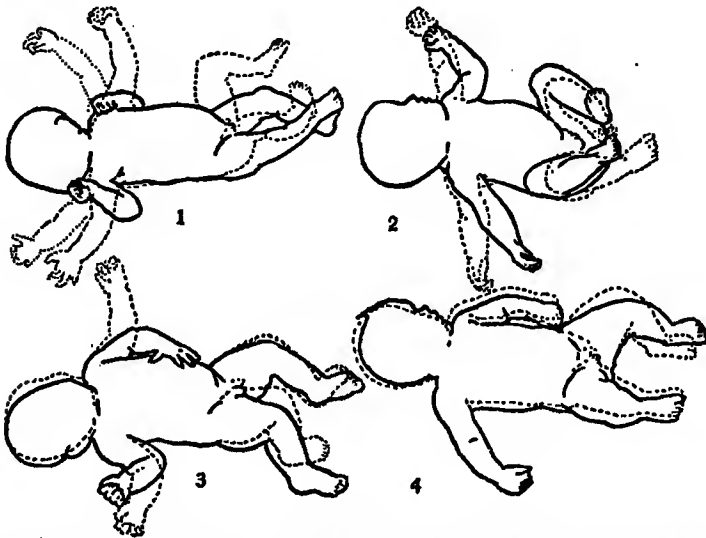


FIG. 17.—The Moro reflex. (1) Characteristic bowing posture of the newborn. (2) Reduction in activity, extension and abduction of upper extremities; bowing eliminated. (3) Greater reduction in the degree of action. (4) Characteristic response of quick body-jerk. (From M. B. McGraw, *Growth: a study of Johnny and Jimmy*. Appleton-Century, 1935.)

The first reflexes to make their appearance are those which have distinct survival value. The patellar, pupillary, and digestive reflexes are all ready to function several months before birth, as may be seen in the case of the prematurely born. Heart action, breathing, and sneezing begin at birth. Sneezing sometimes occurs as the infant is taken from the mother's body and precedes the birth cry. The other reflexes listed above can be aroused within a few hours or days after birth.

The Babinski, Moro-embrace, and Darwinian reflexes appear shortly after birth but disappear within the first months of life. The Babinski, or fanning of the toes, which follows a gentle stroking of the sole of the infant's foot, is generally gone by the age of six months and is never present in normal children after the age of two years. By the end of the first month of life, the Darwinian, or grasping, reflex is distinctly weakened

and normally disappears completely by the fourth month. Only in a few isolated cases are infants able to support their weight, though in many cases the grasp is sufficient to lift the shoulders or head from the surface on which the infant is placed.

The Moro-embrace reflex occurs when the infant is placed flat on his back and the mattress or table on which he is placed is struck with a forcible blow. The infant throws out his arms in an arc movement, resembling an embrace (see Fig. 17). At first there is marked general bodily response with bowing and clutching movements of the arms and legs. Accompanying or following this is vigorous crying. As time goes on, the amount of general bodily activity is reduced so that by the eighth month the Moro reflex takes on the mature form which consists of a quick, fine body jerk, accompanied by crying (McGraw, 1932a).

b. General Responses.—What are often called “general responses” are those that involve larger portions of the body than the so-called “reflexes” but, like the reflexes, are present at birth. They too are direct responses to stimuli, whether external or internal. The most common of these are:

1. Visual fixation on light. During the first day of life, the infant can focus his eyes momentarily on a light held in front of him. Eye movements are, on the whole, very uncoordinated at first.

2. Spontaneous eye movements. These consist of opening the eyes and rolling the eyeballs from side to side, with little or no coordination.

3. Shedding tears. Occasionally, tears are in the eyes at birth. Generally, however, the first show of dampness around the eyes appears from the thirteenth to the sixteenth day after birth.

4. Feeding responses, such as sucking, swallowing, tongue, cheek, and lip movements. The feeding reactions are called forth by a direct stimulation in the region of the mouth, whether it be the touch of a nipple or some object unrelated to food.

5. Sucking fingers. This form of reaction appears as early as 20 minutes after birth.

6. Yawning. This often occurs within the first hour after birth and can be aroused by touching the lips or chin.

7. Hiccoughing. This reaction often appears during the first few hours of life.

8. Rhythmic mouthing movements. Often, during sleep, the infant will open and shut his mouth rhythmically and, in many instances, the tongue will protrude for as much as half an inch.

9. Slight frowning and wrinkling of the brow. This generally occurs during sleep.

10. Turning and lifting the head. When placed either in a prone position or on their backs, infants can lift their heads slightly on the first day of life. This enables them, when prone, to free their noses for breathing.

11. Sitting. When the infant is placed in a sitting position, the flaccidity of his body results in a fall forward into a closed-jackknife position. Several days later, he shows slight resistance to the forward fall.

12. Turning movements. The infant can turn his body slightly by kicking and squirming, but this is not strong enough to enable him to turn from back to side or from face to back.

13. Hand and arm movements. When the infant is asleep, as well as when he is awake, the arms and hands are in almost constant motion. The arms are waved around in a random, aimless fashion and the hands are opened and shut for no apparent purpose.

14. Prancing and kicking. If the infant is supported at the axillae, so that the body weight can rest on the feet, "prancing" movements occur. When the infant is given something to kick against as he lies on his stomach, a few vigorous kicks will push him forward an inch or so.

15. Leg and foot movements. The infant often stretches his toes for no reason other than the mere enjoyment he derives from it. Kicking is very pronounced during infancy and is usually alternate and rhythmic.

As can be seen from the above list, the infant is capable of a large repertoire of activities. What is characteristic of these activities is that in varying degrees, they are undefined, aimless, and uncoordinated. They are, however, the basis from which we shall see skilled actions of a highly coordinated type gradually developing as a result of baby and child's learning.

VOCALIZATION OF THE NEWBORN

The Birth Cry.—The birth cry, which appears at the birth or shortly afterward, marks the beginning of vocalization. This is purely reflex at first and is caused by air being drawn rapidly over the vocal cords, thus setting up vibrations in them. Many fantastic interpretations have been given to the birth cry. Kant referred to it as "a cry of wrath at the catastrophe of birth"; Adler has explained it as an indication of the infant's sudden and overwhelming feeling of inferiority at being placed in so new and complex an environment. In reality, of course, the significance of the birth cry is primarily physiological. It serves two purposes: to supply the blood with sufficient oxygen and to inflate the lungs, making breathing possible.

Variations in the Birth Cry.—The birth cry differs from infant to infant and is, to a certain extent, influenced by the type of birth, as well as the physical condition of the infant. In the quick, expulsive form of delivery, the cry is sharp and deep. On the other hand, in cases of premature birth, or in cases of infants who are in poor condition, a little moan generally accompanies each inspiration. Prolonged labor, resulting in the exhaustion of the infant, is generally accompanied by a weak, short, intermittent cry.

Changes and Developments.—During the first 24 hours after birth, the infant's cry may take on different meanings according to the pitch, intensity, and continuity of the cry. In general *discomfort*, the cry at first is monotonous in pitch, staccato-like, and intermittent; then gradually, unless some relief is given, the cry becomes more incessant. *Pain* is characterized by a cry which rises in pitch. If pain is accompanied

by increasing physical weakness, piercing tones give way to low moans. In *rage*, the cry is longer, the breath is held, and the infant's face often becomes purplish. Gulping sounds, which generally accompany the *rage* cry, result from the opening of the infant's mouth with the resultant closing of the air passages of the throat. Intermittent sobs usually continue even after *rage* has subsided.

Stimulation of Cries.—The stimuli which arouse the infant's cries come from the immediate environment or from the physiological condition of the infant. (Contrast with this the reasons why an older child or adult cries!) Conditions under which crying occurs during the infancy period are as follows: (1) hunger; (2) pain or discomfort from noxious stimuli, such as rough handling, circumcision, sores, and so on; and (3) occasionally fatigue or lack of exercise. No uniform cries for the different situations are necessarily found among different infants. The cries that occur under such circumstances differ in intensity and duration, depending partly on the vocal strength of the infant and partly on the internal or external stimuli which aroused them.

Bodily Accompaniments of Crying.—The crying of an infant rarely occurs without bodily activity of some sort, and this generally begins when crying begins. In the case of vigorous crying, every part of the body is thrown into action. The infant squirms; kicks; flexes and extends his arms, legs, fingers, and toes; rolls his body and turns his head from side to side. The kicking is usually fairly rhythmic but varies somewhat according to the conditions which aroused the crying. In anger, for example, the kicking is more vigorous and abrupt than during other emotional states, and the feet are generally thrust out simultaneously instead of alternately. Irwin (1930) looks upon the mass activity of the infant's body which accompanies crying as furnishing the earliest beginnings of social behavior. In the case of pain, hunger, or colic, this body activity may become a signal that the infant needs attention, and it then serves as a form of language.

Blanton's Experiment.—In an effort to determine the social influence of crying on groups of infants, Blanton (1917) reports an experiment in which graphophone records of the crying of one infant were played for six infants ranging in age from one to fourteen days. This was done during a number of hunger periods. The crying seemed to have no effects whatever on these infants. Two infants were then put on a couch together to see whether the vibrations aroused by the crying of one would bring about crying in the other. When one cried, the other remained quiet, even though awake. There was thus no evidence of social influence at work between the infants themselves.

Explosive Sounds.—In addition to crying, the infant is capable of another type of vocalization, *explosive sounds*, which are not unlike heavy

breathing. These are very commonly referred to as "coos," "grunts," and "gurgles." They are uttered without intent and without meaning and occur purely by chance whenever there is a contraction of the vocal muscles. Since these sounds are low in pitch and weak, compared with cries, they are often overlooked entirely or are regarded as unimportant.

From the long-term point of view, explosive sounds are far more important than cries, which are used less and less as the child grows older. The explosive sounds, on the other hand, are gradually strengthened and develop, during the second half of the first year, into babbling, which in turn develops into speech. When one realizes that the explosive sounds are in reality the fundamentals of speech, their true significance at once becomes apparent.

Sneezing, Hiccoughing, and Yawning.—Sneezing is a reflex type of explosive sound which occurs within the first few hours after birth and occasionally before the birth cry itself. As a rule, the healthy infant sneezes several times a day, and thus clears his nose of any foreign matter. *Hiccoughing* is another explosive sound of a reflex type. This may be observed from the seventh day, and occasionally it occurs before then. Finally, *yawning*, as a type of explosive sound, may be heard as early as five seconds after birth.

EMOTIONS OF THE NEWBORN

Watson's Findings.—Experimental investigations of the emotions of the newborn have been limited in number, but extensive in scope. Watson (1925, 1925a), experimenting with newborn infants at the Phipps Clinic of Johns Hopkins University, made the pioneer study in this field. According to him, at birth or shortly afterward only three distinct emotional reactions occur, and these may be aroused by only a very few specific stimuli. To these emotions he has given the names "fear," "rage," and "love."

The *fear*-reaction pattern may be produced by loud noises from the moment of birth and appears in the form of a jump, a start, a respiratory pause followed by more rapid breathing, sudden closing of the eyes, clutching of the hands, and puckering of lips. The only other stimulus capable of arousing the fear reaction in the newborn, Watson contended, is loss of support, especially when the body is not set to compensate for it. This is best observed in the newborn if, just when the infant is falling asleep, he is dropped or if the blanket on which he lies is suddenly jerked.

Rage, in response to the hampering of bodily movements, can be observed from the moment of birth, though it is more pronounced and more easily observable in babies from ten to fifteen days of age. The response of the infant to the holding of his head, leg, or arms is the stiffening of his whole body, the free slashing movements of his hands, arms,

and legs, and the holding of his breath. No cry is heard at first, but the mouth is opened to its full extent and the breath held until the face becomes blue. This is often followed by crying.

Love has been studied less extensively than the other two emotions because of the prejudice against experimentation in relation to the sex life of the child. From incidental observation, rather than from direct experimentation, Watson has come to the conclusion that the stimuli which call forth the love response are the stroking of the skin, tickling, gentle rocking, and patting. These responses are easily aroused by stimulating the erogenous, or sex, zones, such as the nipples, lips, and sex organs proper. The response to such stimulation is usually smiling, gurgling, cooing, and waving of the arms and legs, all of which denote a happy or good-natured emotional state on the part of the infant.

Watson's analysis of the three emotional states, present in the newborn, was accepted uncritically by child psychologists at first. Gradually, however, repetitions of Watson's experiments on newborn infants did not substantiate completely Watson's findings. The result has been that today it is questioned whether or not the newborn experiences such definite and clear-cut emotional states as Watson described.

Some of the most carefully carried out of the experimental studies, aimed to substantiate or disprove the contention of Watson that there are three emotions, fear, rage, and love, which can be aroused in the newborn by only a few specific stimuli, will be summarized below to show what knowledge we have to date of the emotional states of the newborn. Further experimental evidence may bring a decided change in the present knowledge of infant emotions.

TABLE VI.—JUDGMENTS IN THE NURSERY BY MEDICAL STUDENTS AND NURSES OF THE EMOTIONAL RESPONSES OF INFANTS WHEN THE STIMULI WERE NOT SEEN

Judgments	Stimulus			Total
	Dropping	Restraint	Needle prick	
Colic.....	13	9	4	26
Fear.....	4	17	3	24
Anger.....	8	4	10	22
Hunger.....	8	4	4	16
Pain.....	4	2	10	16
Awakened from sleep.....	11	2	1	14
Organic brain emotion.....	1	7	3	11
Tight bandage.....	1	3	2	6
Uncomfortable.....	2	0	1	3
Total.....	52	48	38	138

Source: SHERMAN, M., and SHERMAN, I. C. *The process of human behavior*. New York: Norton, 1929, p. 137. Quoted by permission.

The Shermans' Critical Findings.—Sherman and Sherman (1929) carried out an experiment with infants ranging in age from 112 to 160 hours to discover whether, in the absence of knowledge of the stimulus given, medical students and student nurses could determine accurately the emotional state of the infant. The stimulus was applied to the infant, and immediately the screen which hid the infant from view was removed. The observers were asked to watch the infant's behavior with special emphasis on the movements of the arms, legs, and body, the type and duration of the cry, the facial expression, and changes in breathing. The judgments made were as shown in Table VI.

The above data have led the experimenters to conclude that "there is thus no agreement between observers in estimating emotional reactions to stimuli which presumably arouse a given response, even when they see and hear the infant's responses, which show that these reactions are not generally expected."

When an attempt was made to judge the emotional state of the infant from the cry alone, the results showed as great lack of agreement as when the behavior was observed. The judgments made in connection with this part of the experiment were as follows:

TABLE VII.—JUDGMENTS OF THE EMOTIONAL CHARACTER OF THE CRYING OF INFANTS

Judgments	Stimulus				
	Hunger	Dropping	Restraint	Needle prick	Total
Colic.....	4	7	3	2	16
Hunger.....	6	2	2	5	15
Pain.....	0	3	5	5	13
Anger.....	2	6	2	1	11
Fear.....	3	1	4	0	8
Awakened from sleep.....	1	0	3	4	8
Irritation.....	0	0	3	1	4
Sleepiness.....	2	2	0	0	4
Discomfort.....	0	1	0	1	2
Grief.....	1	0	1	0	2

Source: SHERMAN, M., and SHERMAN, I. C. *The process of human behavior*. New York: Norton, 1929, p. 139. Quoted by permission.

In conclusion, the authors state that "most persons judge the emotional behavior of an individual in terms of the stimuli which have produced the reaction."

In contradiction to the conclusions which Watson has drawn in connection with rage and the stimuli that arouse it, Sherman and Sherman state that they have evidence that "any form of *sudden* stimulation, such as dropping, loud noises, restraint, pain, or a rush of air on the face,

produces in the young infant aimless activity of most of the musculature, accompanied by crying. The stimuli must be sufficiently strong, however, to produce the reaction—the younger the infant, the stronger must be the stimulus. This is also true for so-called pleasurable stimuli, such as stroking or petting, to which many newborn infants show no overt reaction."

Differences in emotional response, the Shermans believe, are dependent upon the quantitative aspects of the stimulus. When the intensity and duration of the stimulus are varied, the resulting reactions differ noticeably. The emotional responses of infants below twelve days of age "possess no inherent characteristics which can be noted or adequately and precisely described."

Other Findings.—Using "rage" stimuli (arm restraint and nose restraint) and "fear" stimuli (drop and loud noise), similar to those described by Watson, Taylor (1934) studied 40 infants ranging in age from one to twelve days. He found no constant pattern responses in the infants studied when different stimuli were applied. Any one of the four stimuli used produced all the responses found when the other stimuli were used. The responses evoked were so general in form that Taylor was led to conclude that "the infant's behavior is best characterized as generalized activity."

Pratt (1934a) contends that infants show increased activity in immediate response to auditory stimuli, and that it is therefore unwise to look upon this response as an emotional state of fear, since there is no "stirred-up state of the organism" accompanying it and since increased activity is of shorter duration than is characteristically found in fear. The infant's fear, he maintains, seems more like startle than real fear and, for that reason, should not be classed as "fear." Irwin (1930) has reported that when external conditions were kept constant, no fear reactions were observed during the first ten days of life. Fear responses are not typically elicited by loud noise or dropping, and the behavior that occurs is generalized "mass" activity.

Rage, Pratt, Nelson, and Sun (1930) found, is more like general crying and unrest, characteristic of hunger and other states of discomfort, than like real anger. To verify Watson's analysis of the stimuli which arouse the "rage" emotion, Pratt (1932) held the nose and arms of 67 newborn infants. Reactions occurred in 96 per cent of the cases. The typical reactions were drawing back the head, arching the back, general restlessness, and nonspecific body movements. Pratt concluded that "we cannot substantiate Watson's contention that defense reactions are the typical reactions to this form of stimulation." When the arms were held firmly against the infant's body, Pratt found that in 58 per cent of the cases the infants remained passive; in 26 per cent there was a

brief period of activity which gave way to inactivity; in 13 per cent the arms flexed, and there were other signs of activity; while in 3 per cent of the cases, a brief period of quiet was followed by activity. The results thus agree with those of the Shermans that no definite "rage" reactions were found, even though a large number of cases were tested.

Watson's theory of the emotions of the newborn holds that crying is an integral part of the fear pattern. Irwin (1932*e*) has investigated body startle in criticism of Watson's theory of fear as it appears in the newborn. Twelve infants were tested in a Pratt Experimental Cabinet, in which sounds were produced by a loud-speaker placed four inches from the crown of the infant's head. The body jerk was then recorded by means of a stabilimeter. The latent time of body startle was found to vary from 0.07 second, with a mean at 0.18, which is comparable to the simple auditory reaction time of adults. Crying never accompanied the body startle to loud noises, though eyelid responses occurred even when no other overt response was observable.

To test Watson's contention that loss of support is the only stimulus, other than loud noises, capable of arousing fear responses, Irwin (1932) dropped infants two feet while in a supine position. In 88 per cent of the trials, some movement occurred. Of these movements, 46 per cent were confined to the arms alone, while the extensor-flexor pattern of the arm and leg movements occurred in 53 per cent of the trials. In only 3 per cent of the cases did crying occur.

Motion pictures of the responses of newborn infants to revolver shots convinced Hunt, Clark, and Hunt (1937*a*) that there were no responses like those described by Watson. In very young infants, the response was more like the Moro reflex but it was accompanied by crying. At four months of age, however, Hunt, Clark, and Hunt (1936) found that the Moro reflex disappeared and a startle pattern, like that of adults, appeared. Hunt and Clark (1937) have suggested that the startle pattern is an unlearned reaction from which all other emotional responses develop as a result of maturation and conditioning.

One Characteristic.—The outstanding characteristic of the infant's emotional make-up is the "wholeheartedness" or complete absence of gradations of response to stimuli of different degrees of intensity. Regardless of the stimulus, the resultant emotion is intense in character and sudden in appearance. As the emotional life develops, through the childhood years, this "all-or-none" condition gradually gives way to a controlled system of well-graded and controlled emotional states.

SENSITIVITIES OF THE NEWBORN

It is difficult to determine what sensations the infant is capable of experiencing at birth. Inasmuch as sensation is best studied by the introspective method, a method that cannot be used in the prespeech level of development, it is impossible to determine accurately what the sensations of the newborn are, and how they compare with the sensory experiences of older children and adults. In experimental studies of the newborn, the criterion generally used to determine the presence or absence of a given sensory capacity is some motor response to the sensory stimulus which normally would arise from the sense organ stimulated.

Methods of Study.—Throughout the discussion of sensitivities of the newborn, references will be made to the techniques used by the different investigators. In some instances, the methods have lacked scientific accuracy, primarily because of lack of control over the conditions of the experiment. Recently, however, many of the experiments designed to measure the sensitivities of the newborn infant have used the technique employed by Pratt, Nelson, and Sun (1930) at The Ohio State University. In some instances, slight modifications have been made in the technique but, for the most part, the methodology has been accepted unchanged.

A brief example of the carefully controlled conditions of Pratt, Nelson, and Sun's experimental technique will be in order. In a study of olfaction, they used a puff of air as the control stimulus, with vaporized odors of valerian, acetic acid, oil of clover, and ammonia as the olfactory stimuli. Any movements made when the control, or olfactory, stimuli were used were recorded by movements of the stabilimeter or platform on which the infant was placed during the experiment. The stabilimeter was in the experimental cabinet, described earlier in the chapter (Fig. 15), and adjusted so that any movements of the infant's body were recorded on a roll of paper. It was thus possible for Pratt, Nelson, and Sun to compare the activity of the infant before and after the olfactory stimulus was presented.

At times, it has been found impossible to distinguish between responses to sensory stimuli and responses which are not characteristic of the sense organ stimulated but which may occur as spontaneous activity. In infants, the absence of motor response may be due to the weakness of the stimulus used rather than to lack of sensory experience. In spite of this fact, the psychologist hesitates to use stronger stimuli for fear that some injury may result in the delicate sense organs of the infant. For that reason, there is no positive evidence that lack of motor reaction is indicative of lack of sensory experience.

Condition of Sense Organs.—There are evidences that at birth or shortly afterward the sense organs are ready to function. While the reactions of the infant to sensory stimuli are not necessarily similar to those of an adult, nevertheless a selective reaction is made. Some of the sense organs are more highly developed than others, and the resultant sensations are consequently stronger and more nearly like those of adults. Of all the sensitivities, reactions to the stimuli of touch upon the skin are found to be the most numerous. Peterson and Rainey (1910) studied the reactions of premature infants to different sensory stimuli and found that even in cases in which birth occurred during the seventh lunar month the infants reacted in a manner similar to that of infants born at full term. Peiper (1924) reported that in the case of three premature infants studied by him, they were no less sensitive to sound, light, pain, and cold stimuli than infants born at full term.

The following types of sensitivity have been investigated in the newborn:

1. *Sight*.—At birth, the retina has not reached its mature development. It is thinner than in the adult eye, and the cones in the fovea are short and ill-defined. The area of the retina is smaller than in the adult eye, but the number of cones per unit area is the same. At thirty hours of age or shortly afterward, the pupillary reflex is well established. Before that, there is only a sluggish response to light. The protective responses of turning the head, closing the eyelids, and crying appear shortly after birth. Optic nystagmus, the ability to follow moving objects and then move the eyes backward in the opposite direction, comes several hours after birth. Ocular pursuit of a moving object is poor unless the object moves slowly. Horizontal, vertical, and circular pursuit with both eyes develops markedly during the first ten days of life (Beasley, 1933).

In the studies made by Peterson and Rainey vision was measured by (1) response through signs of discomfort and (2) starting at lights, objects, and persons. They found that, during the first week of life, 839 out of 944 infants studied responded to light by signs of discomfort, while in the second week, 75 out of the remaining 105 did so. When the response to light, object, or person was used as a measure of visual sensitivity, they discovered that of the 144 cases studied, 59 responded in the first week, 73 in the second, 10 in the third, and 2 in the fourth.

The question of whether or not the infant sees color has not yet been experimentally determined. Studies of the development of cones in the eye of the newborn have given no clue as to sensitivity to color. Any attempt to determine color sensitivity at birth must be based on the manner of functioning of the eye and not on its anatomical condition. As early as 1881, Preyer (1888) reported that at birth the infant can perceive only the difference between light and darkness, while colors cannot be distinguished correctly until the age of three or four years. Canestrini (1913) maintained that particular responses to particular colors were not made by the newborn. Colored lights produced results similar to those of white light.

Smith (1936), on the other hand, reports that infants seven to nine days old appeared to respond in a slightly dissimilar way to different colors of the same physical energy. Blue had the most marked effect in inhibiting activity; green was less effective, and red had the least effect of all. Girls were affected more by colors than were the boys studied, who appeared to be partially color blind and incapable of seeing red.

2. *Hearing*.—There seems to be no agreement among scientists as to whether or not infants respond to sound stimuli by auditory sensations immediately after birth. Some report that reactions occur within 10

minutes after birth, while others report that deafness exists during the first few days of life. At birth, hearing seems to be at the lowest stage of development of all the sensitivities. Many infants are totally deaf for several hours or days after birth, owing primarily to the stoppage of the middle ear with amniotic fluid. Very often, loud noises near the ear of the newborn produce little or no reaction. There are, however, individual differences in infants in their sensitivity to sound stimuli.

Testing auditory sensitivity by means of a rattle, low voice, lip sounds, tearing of paper, and falling of a hammer head revealed that in two-thirds of the infants tested by Peterson and Rainey (1910) squirming or some similar response was made during the first week of life. When hearing was delayed beyond this date, they maintained that in the majority of cases it was due to fluid in the ears which had not drained completely after birth. Using such stimuli as tuning forks, electric bells, wooden bells, cans, and snappers, Pratt, Nelson, and Sun (1930) found that in 46 per cent of the cases definite movements were made. A larger percentage of responses was made to the can, snapper, and electric bell than to the tuning fork and wooden bell.

Testing the hearing of the newborn with a small hand bell with a pitch of approximately 512 vibrations per second, Bryan (1930) found that during the first week of life not all infants tested gave evidence of being able to hear these sounds. The average newborn gives no evidence of hearing ordinary sounds during the first two days of life, though most newborn infants make some response to stimuli of this sort from the third to the seventh day. Reactions to noise, such as the rattling of paper or the striking of a porcelain plate with a spoon, are more positive than to the voice, even when a loud conversation is being heard. It is not until the fourth week that the reaction to the voice is more frequent than to loud noises (Hetzer and Tudor-Hart, 1927).

3. *Taste*.—Studies of the sensitivity to taste stimuli on the part of infants have revealed that the newborn infant has a more highly developed sense of taste than of sight or hearing. Peterson and Rainey (1910) found that about 800 of the 1,000 newborn infants studied by them gave distinctive reactions to taste stimuli during the first week of life and the remaining number of the second week. The reactions of the infants to sweet and salt stimuli were primarily positive, evidenced by contented sucking, while the reactions to sour and bitter were largely negative, in the form of discomfort reactions. The reactions shown in Table VIII were obtained from infants during the first week of life.

In Pratt, Nelson, and Sun's (1930) experiment on infants given stimulations of sugar, salt, quinine, water, and citric acid at room temperature, there were reactions, at the age of one day, to 86 per cent of the stimulations and, at the age of 11 days and older, to 81 per cent.

The reactions which occurred were sucking, movements of the extremities, general body movements, head movements, facial movements, and eye movements. Twenty-five per cent of the reactions were to citric acid, 24 per cent to quinine, 19 per cent to sugar, 17 per cent to salt, and 15 per cent to water.

TABLE VIII.—SENSORY REACTIONS OF INFANTS

Response	Sweet	Salt	Bitter	Sour
Contented sucking.....	747	503	31	136
Discomfort reaction.....	37	295	780	659

Source: PETERSON, F., and RAINCY, L. H. *Beginnings of mind in the newborn*. New York, *Bulletin of the Lying-in Hospital of the City of New York*, 1910.

Shirley (1931a) found reactions to sour, bitter, and salty stimuli to be primarily those of rejection, shown by a turning of the head from side to side, screwing up of the face, crying, or slashing the arms. Positive reactions of sucking, on the other hand, occurred when sweet stimuli were used. In general, then, it may be said that the studies made to date show that the responses the infant makes to sweet stimuli are positive while those to salt, sour, and bitter stimuli are negative. There are, however, wide individual differences in taste thresholds (Dockery, 1934).

4. *Smell*.—Using such stimuli as *asafetida*, *oleum dippelii*, acetic acid, ammonia fumes, petroleum, compound spirits of orange oil and geranium, and mother's milk, experiments by Preyer (1888), Peterson and Raincy (1910), and Pratt, Nelson, and Sun (1930) have shown that the sense of smell is well developed in the newborn. This high sensitivity is shown in such reactions as squirming, crying, grimaces, and sucking movements and may be observed within the first hour after birth. Reactions to olfactory stimuli are made when the infant is asleep as well as when awake, and refusal to take the breast occurs whenever the breast has been rubbed with such an odor as petroleum (Preyer). Ammonia and acetic acid prove to be the most effective stimuli in arousing definite responses in infants, though they respond to weaker stimuli such as valerian and cloves, indicating an ability to smell them also. Wide individual differences, however, occur in infants, as well as in the same infant from one day to another (Disher, 1934).

5. *Skin Sensitivities*.—The skin sensations of touch, pressure, temperature, and pain are present at birth or shortly afterward. Sensations of touch are present at birth in all parts of the body. This may be seen whenever the stroking reflex occurs. Some parts of the body, however, are more sensitive than others. The mucous membrane of

the lips, for example, is hypersensitive, while the skin of trunk, thighs, and forearm is hyposensitive. Blanton (1917) reports that on six occasions she had observed marked shivering within 15 minutes after birth, on two of which occasions it persisted until the infant was put near a hot-water bottle.

Cold stimuli produce prompter and more pronounced reactions than heat stimuli (Canestrini, 1913). Responses to stimuli ranging from 16 to 45°C. occur in infants as young as forty-one hours old. Reactions to temperature stimuli ranging from 8 to 53°C. have been found by Pratt (1930) to take the form of sucking, movements of the extremities, face, mouth, eyes, and general bodily movements. Less intense reactions occur to temperatures warmer than the body temperature than to those colder than the body temperature. More reactions to cold stimuli consisting of chilled metal cylinders placed on the forehead and inside surface of the knee occur when the infant is asleep than when awake (Pratt, Nelson, and Sun, 1930).

Sensitivity to temperature stimuli is likewise displayed by the infant's refusal of milk of the wrong temperature or crying in response to water that is too cold or too hot. Jensen (1932) noted differential sucking reactions to changes in the temperature of milk. Large individual differences existed, but the threshold for the same infants remained constant over the period when he tested them.

Sensitivity to pain is weak during the first day or two of life. The places of highest sensitivity are the soles of the feet, the lips, eyelashes, mucous membrane of the nose, and skin of the forehead. The body, legs, underarms, and hands are hyposensitive as compared with the adult. Pain responses not only appear earlier in the anterior end of the body but they also develop more rapidly than those in the posterior end. This is seen by the fact that the infant's face is more sensitive to painful stimuli than the legs, and this holds true for the first four days of life.

Circumcisions performed under two weeks of age without the use of an anesthetic cause no pronounced suffering; and lumbar punctures performed without anesthetic produce only a momentary pain reaction. In an adult, both would be very painful. A study by Sherman and Sherman (1925) showed that simple needle pricks, applied to the cheeks, thighs, and calves of the legs of the newborn, resulted in no reactions before the age of six hours. At five hours, the infant responded when the cheek was pricked 10 times in immediate succession, but no response was made to repeated stimulation of the leg. When the infant was forty-one hours old, there was a response to a single prick on the face, and after seventy-six hours, to a single prick of the leg. Reactivity to pain increases with age (Sherman, Sherman, and Flory, 1936).

6. *Organic Sensitivities*.—It is difficult to tell specifically whether the organic sensations of hunger and thirst are developed at birth. Crying may indicate only general discomfort, or it may be the result of specific discomfort arising from hunger and thirst. Hunger contractions appear to be fully developed at birth. They differ from those of an adult only in that they occur at more frequent intervals. Studies of newborn infants by Carlson and Ginsburg (1915), in which the subjects swallowed rubber balls attached to a catheter, showed that hunger contractions appeared even before the stomach contained food. The hunger contractions appeared very soon after birth. Hunger periods occurred every ten to fifteen minutes and ended in a complete tetanus, or rigid contracting of the muscles.

CONSCIOUSNESS OF THE NEWBORN

How does the world appear to the newborn, and of what is he conscious as he first observes the environment into which he is born? For years, interest of a speculative sort has been concentrated on this problem; but, because of its highly subjective nature, it is impossible to do more than guess from the infant's behavior as to what goes on in his mind and what he perceives during the first days after birth. The limited information we have comes from our knowledge of the conditions of the sense organs at birth and from observations of the infant's behavior in different situations.

Many attempts have been made to describe infant consciousness. One of the earliest of these is the oft-quoted statement of James (1890) that the "baby, assailed by eyes, ears, nose, skin, and entrails all at once, feels it all as one great, blooming, buzzing confusion" (488). And, in his analysis of sensations, he says that "prior to all impressions of the sense organs, the brain is plunged in deep sleep and consciousness is practically non-existent. Even the first few weeks after birth are passed in almost unbroken sleep by human infants. It takes a strong message from the sense organs to break this slumber" (pp. 7 to 8).

Stern (1930), while stating that the newborn infant is mainly a "creature of reflexes," nevertheless grants that the first traces of consciousness may be present at birth. According to him, "all that we are possibly justified in assuming is the presence of a dull, undefined foreshadowing of consciousness in which the sensorial and emotional elements are so inextricably intermingled that they may be designated either as 'sense-emotional states' or 'emotional-perceptive states.' The presence of feelings, of comfort, or discomfort is evinced from the very first day by the bodily habit as a whole, by the expression of the face, and by the active expression of screaming." Koffka (1925) believes that the "newborn infant experiences the world differently from us adults, just as an unmusical person hears a symphony differently from one who is musical."

CONDITIONING IN THE NEWBORN

The ability to learn on the part of the newborn has been denied by the Pavlovian school of Russian physiologists and psychologists on the grounds that the formation of conditioned responses is impossible because, during the first few months after birth, the cerebral cortex functions very incompletely. To investigate this matter, Marquis (1931) tried to condition the feeding reactions of eight newborn infants to the sound of a buzzer. Each feeding, from the first time they were fed, was either immediately preceded or accompanied by a buzzer. After 3 to 6 days of experimentation, seven of the eight infants began to show significant changes in their reaction after the buzzer was sounded. Sucking and mouth opening increased, while general activity and crying decreased. The former two reactions are directly related to food taking, while the latter two are not. In the one infant in whom a conditioned feeding response was not made, the physiological condition was poor.

Wenger (1936) applied the conditioning technique to three different situations. In the first situation, a flashlight strong enough to produce closing of the eyelids was used while at the same time a vibrator was placed on the infant's body. In the second series of the experiment, an auditory stimulus was associated with a mild electric shock, and, in the third, Marquis's technique, described above, was duplicated. The results of the three series led Wenger to conclude that the conditioned response is difficult to elicit during the first 10 days of life, and, when it does appear, it is unstable. Conditioning of the feeding response was found to be especially poor, and satisfactory results could not be obtained even after eight weeks of training. Wickens and Wickens (1939), as a result of their studies, question whether conditioning takes place in the newborn. In their experimental group the infants received paired stimulation of a buzzer and a shock to the sole of the foot while, in the control group, the shock alone was used. Both groups, at the end of the third day of the experiment, showed clear-cut responses to the buzzer alone, even though the control group had never had the paired stimulation of buzzer and shock.

Whether it will be possible to condition the emotions of the newborn, as can be done easily and quickly during the first year of babyhood, has not yet been investigated. Likewise, since the infant's food is limited in variety, the problem of conditioned taste likes and dislikes is not important and, as a result, has not been investigated. The infant's complete unawareness of the individuals present in his environment does not offer an opportunity for the study of conditioned social likes and dislikes. Therefore what learning there is through the conditioning technique is apt to take place in connection with feeding and emotions alone.

CHAPTER V

PHYSICAL GROWTH

Physical and Mental Growth.—Physical growth is a topic that does not necessarily belong in a book on psychology. But, because the relationship between physical and mental growth is so marked, it is impossible to have a real understanding of the development of the child's behavior without considering the growth of body structure. Only the phases of physical growth which have a definite bearing on mental growth will be discussed.

The relationship between physical and mental growth is of two types: (1) many aspects of the child's mental development are directly dependent upon his physical development, and (2) the malfunctioning of the physical organs not only affects the child's mental development but, in many cases, it is responsible for abnormal behavior. Illustrations of these two types of relationship will bring out their real significance.

Normal Physical Development.—The *emotionality* of the baby between the ages of six months and 2½ years may be traced to the cutting of teeth. Each new tooth is accompanied by some physical upset, even though it be of a minor sort, and this predisposes the baby to general irritability. Nervousness and emotionality are very pronounced at puberty and are the direct outgrowth of the physiological changes occurring at that time. The *play* of the child at all ages is dependent upon his physical as well as his mental development. The size of his body, the strength of his muscles, and the amount of fat he has, all determine to what extent he can take part in the games and other play activities of the children of the neighborhood. *Intelligence* is directly dependent upon the size and structure of the brain.

The influence of the child's *physique* on his attitude toward the social group is very great. Because of his inferior size, the little child feels shy in the presence of adults while, in the presence of bigger children, he feels inferior. *Sexual maturing* affects the social attitudes of both boys and girls. They are embarrassed by the physical changes that take place in them, such as the change of voice in boys and the enlargement of the breasts and hips in girls. Because they resemble adults not only in size but also in contour, boys feel that this gives them adult rights and privileges, and girls rebel when they find that physical maturity handicaps and thwarts their desires to behave as adults do. Much

of the *restlessness* that characterizes the adolescent is due to physical causes, such as muscle cramps, glandular activities, and hunger caused by ravenous appetites.

Malfunctioning of Physical Organs.—The malfunctioning of any physical organ interferes with normal mental development. The child suffering from marked thyroid deficiency, "cretinism," is not only physically deformed but also mentally deficient. Physical and intellectual growth have thus been stunted by the abnormal functioning of the *thyroid glands*. *Deafness*, *blindness*, or a *weak heart* keeps the child from entering into the play activities of other children. The result is the development of unsocial behavior and an attitude of inferiority which often colors the child's entire behavior. The attitude of other children toward the child who suffers from some physical defect is also unfavorable. He is neglected, ridiculed, or sympathized with, depending on the severity of his defect, and this affects his attitude toward himself.

The common ailments that occur in *puberty*, such as skin eruptions, headaches, general fatigue, and changes in *urica*, give rise to anxiety, worry, and emotional disturbances on the part of the adolescent. Physical disproportions, due to different rates of growth, such as feet, hands, and noses that are temporarily too large for the rest of the body, are the cause of much worry. Delayed puberty, especially in boys who look small and childish by comparison with adolescent boys of the same age, gives rise to feelings of inferiority, while accelerated puberty leads to feelings of inferiority or superiority, depending upon the reactions of the adolescent's playmates toward his or her mature appearance.

Because what a child can do, say, think, or feel at a given age depends to such a large extent upon the stage of physical development he has attained, the child may rightly be said to "behave in accordance with his physical age." The stage of the child's physical development is thus more significant than his chronological age in determining his behavior.

Methods of Studying Physical Development.—Two methods have been used to study physical development. The first consists of repeated measurements on the same individual's year after year, to trace the growth that occurs at each age. The second method consists of measurements of large groups of individuals of different ages, to obtain a norm or standard for those ages. The groups studied must be large enough to minimize the influence of individual variations, if the results are to be of any value.

GROWTH CYCLES

Growth is rhythmic, not regular. A child does not grow a given number of pounds annually. Growth comes, on the contrary, in cycles or waves. Rapid growth is followed by a resting period, when growth slows down markedly, and then, later, rapid growth is resumed. There are

three important growth cycles from birth to maturity. These cycles start with a period of relatively slow growth, which is followed by very rapid growth, and then, in order, by a period of slackening of growth. The first growth cycle occurs in early babyhood, during the first two years of life; the second during late childhood, just before puberty; and the third in the early teens, the adolescent period.

These growth cycles are so universal and so predictable that clothing for children is sized accordingly. The rapid growth in the first year necessitates two sets of clothing, the *infant* size for the first six months and the *first* size for the last six months. The next larger size is adequate for the child from his first to his second birthday, while the size larger serves for two years, from the second to the fourth birthday. Sizes suited to the development of older children and adolescents likewise take into consideration the growth and the resting periods.

Growth Cycles for Different Organs.—Each organ and each part of the body follows its own laws of development. The different parts of the body have their own individual periods of rapid growth, and each reaches its mature size at its own individual time. In general, growth of the parts of the body follows the *law of developmental direction*, referred to in Chap. II and explained in more detail in Chap. VI. This means that, for the most part, development occurs first in the upper part of the body and later in the lower part of the body. Similarly, the brain and facial features attain maturity in development before the organs and features of the lower trunk and limbs.

Growth Cycles within the Year.—Growth within a calendar year comes in cycles just as it does from one year to another. July to middle December is the season most favorable for increase in weight, with the most rapid gain from September to December. At this time, the average gain is four times that from February to June. The least growth comes from the beginning of May to early July. Growth in height, on the other hand, follows an entirely different cycle. The greatest increase comes from April to the middle of August, paralleling the slow period of increase in weight, while the least increase comes from August to the end of November, the period of greatest increase in weight.

HEIGHT

The baby at birth measures 19 to 20 inches in length, on the average, though slight variations occur due to parentage, sex, and racial factors. The first two years of life are marked by a rapid increase in height. During the first four months, the baby normally grows from $2\frac{1}{2}$ to $3\frac{1}{2}$ inches, making him 22 to 23 inches tall. When he is eight months old, the average baby measures between 25 and 27 inches and, when a year old, 27 to 29 inches.

During the second year, his height increases about four inches, which means that he should be approximately 32 inches tall at two years of age. From the third to the sixth year, growth in height occurs at a slower rate. There is an average increase of three inches annually, so that by the time he is six years old the child's height should have doubled since birth, making him 40 inches tall.

Height at Puberty.—Up to the onset of puberty, between the tenth and twelfth years, height develops slowly and with a fair degree of uniformity. At twelve years of age, children should be $2\frac{3}{4}$ times their birth height, or 55 inches tall, which means an average annual gain of slightly more than 2 inches. From ten to fourteen years in girls, and twelve to sixteen years in boys, there is a rapid growth spurt, followed by a period of very slow growth until eighteen or twenty years, when mature height is attained.

Growth at puberty has been studied by Van Dyke (1930) in a group of girls who matured at different ages from twelve to fifteen years. The greatest increase in height was found to occur in the year preceding puberty, with an average of 2.9 inches for the entire group. The next greatest increase, 2.6 inches, came two years before maturing. In the two years preceding puberty, there was thus an average gain of 5.5 inches.

At fourteen years, the average height for boys is 60.3 inches, and at sixteen years, it is 65 inches.) How tall the boy or girl will be at maturity differs according to hereditary endowment. (The average mature height for men is 67 inches, and for women, 64 inches.) In Fig. 18 the curve shows the percentage growth in height from birth to maturity.

Individual Differences.—From birth to the eleventh or twelfth year, boys are, on the average, taller than girls. Girls, at the age of twelve, are slightly taller than boys. At the age of fifteen, both sexes are about the same height. After that age, boys are taller than girls and retain that superiority in height during the remainder of the growth period.

Children who are tall before adolescence tend to be taller than the average at maturity, while those who are short before adolescence generally measure below average when they reach maturity. There is thus a definite relationship between height before and after adolescence. Likewise, in the case of girls, those who mature early are taller than those who mature later.] The girl who matures before thirteen years of age is taller at every age from six to fourteen than the girl who matures at thirteen or after thirteen.

Racial factors are important in determining the height of the child at all ages. Children of North European parentage are, on the average, taller than children whose parents come from southern European stock. Socioeconomic factors are likewise important, with children of the more-favored groups, averaging above those of the less-favored groups.

Improved feeding, especially during the earlier years of life, is also important. Harvard students of this generation were found by Bowles (1932) to be $1\frac{1}{3}$ inches taller and 10 pounds heavier than their fathers, while at four Eastern colleges girls averaged 1.1 inches taller and 3.9 pounds heavier than their mothers.

To determine the relationship between height and intelligence, Hollingworth (1926) measured a group of children from nine to eleven

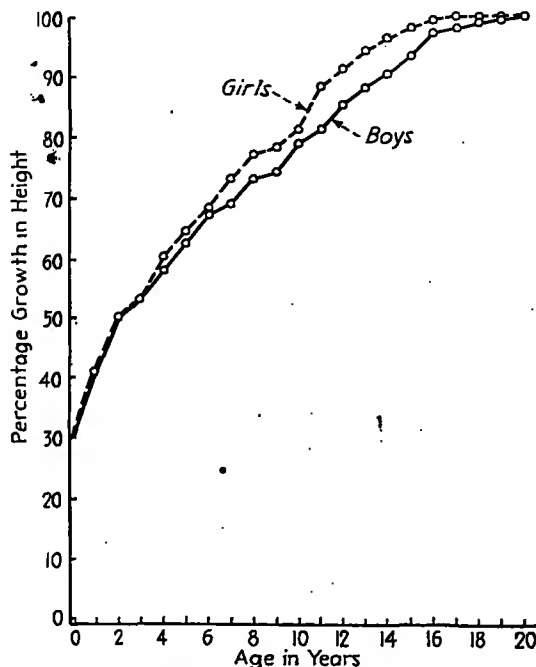


FIG. 18.—Percentage growth in height for boys and girls from birth to maturity. (From L. H. Meek, *Your child's growth and guidance told in pictures*. Lippincott, 1940.)

years old, with I.Q. scores of 135 to 190. She compared this group with children whose I.Q. scores ranged between 90 to 110, and with another group with I.Q. scores below 65. The gifted group had a median height of 52.9 inches as compared with 51.2 inches for the average group and 49.6 inches for the group with I.Q. scores below 65. There thus seemed to be a definite relationship between height and intelligence, with bright children taller than dull children.

WEIGHT

The average baby at birth weighs from 6 to 8 pounds. Girl babies are, as a rule, lighter than boy babies. During the first week following birth, the baby normally loses weight, owing to the difficulty of becoming adjusted to a new method of taking nourishment, as well as to a new type

of nourishment. By the end of the first month of life, however, the baby should not only regain the weight lost after birth but should begin to show a weight increase. (At the age of four months, the weight should be double the birth weight, which means that the baby should weigh approximately 14 pounds. The average weight varies from 16 to 19 pounds at the age of eight months, and at one year the baby should be three times his birth weight, or about 21 pounds.) This relatively slight increase during the final quarter of the first year is due to the fact

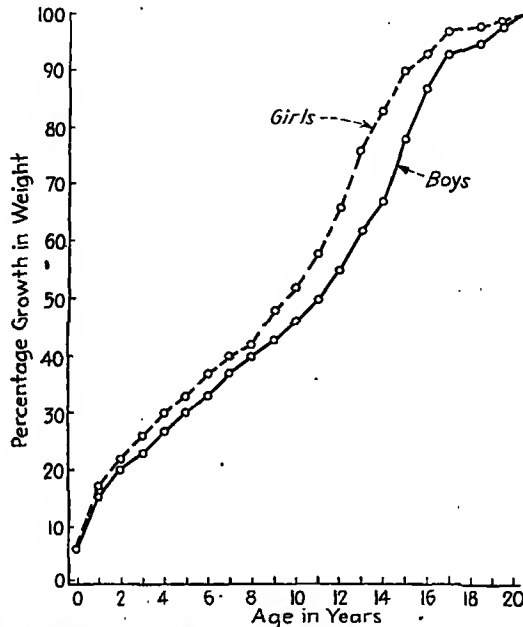


FIG. 19.—Percentage growth in weight for boys and girls from birth to maturity. (From L. H. Meek, *Your child's development and guidance told in pictures*. Lippincott, 1940.)

that the baby's waking hours are spent mostly in creeping, crawling, and learning to walk.

(During the second and third years, the average increase in weight is from 3 to 5 pounds annually. This means that the typical two-year-old should weigh 25 pounds and the typical three-year-old, 29 or 30 pounds. Babies who are relatively heavy at birth weigh slightly above the averages given during the first two or three years of life.) Artificially fed babies generally weigh less than breast-fed babies throughout the eight months following birth.)

Increases in Late Childhood.—(From the third year, increase in weight slows down until the onset of puberty, with an average increase of 3 to 5 pounds annually. The child should be approximately five times his birth weight at six years of age, which means a weight of 35 to 40 pounds.

Beginning with the ninth or tenth year, in the case of girls, increase in weight occurs at a rapid rate and reaches its peak at the age of twelve years, with an average annual gain of 14 pounds. Increase in weight preceding puberty has been investigated by Van Dyke (1930) in girls maturing between the ages of twelve and fifteen years. The greatest increase in weight, an average of 14 pounds, occurred in the year before puberty, with the next greatest increase, 10.1 pounds, occurring two years before puberty and the same amount in the year of puberty.

For boys, the marked increase in weight at the time of puberty is delayed until the twelfth year, and the peak of weight increase comes in the fourteenth year, an average annual gain of 15 pounds. The average weight for a boy at fourteen is 95.4 pounds and at sixteen, it is 116.7 pounds. During the remaining years of adolescence, increase of weight comes mostly from increase in muscular development and in the size of the skeletal system. Figure 19 shows the percentage growth in weight of boys and girls from birth to maturity.

Individual Differences.—Boys are, on the average, heavier than girls at all ages except for two or three years, from eleven to fourteen, when the puberty spurt of girls precedes that of boys. Intelligent children are heavier for their height, Hollingworth (1926) found, than are average children of the same age. In the fall months, gain in weight is usually greater than at other times of the year, especially after the fourteenth year.

PHYSICAL PROPORTIONS

At birth, the proportions of the body are very different from those of the adult (see Fig. 3). The child's growth therefore results not only in an increase in size but, of equal importance, in a marked change in the proportions of the different parts of the body. Likewise, not all parts of the body attain mature proportions at the same time. Some areas attain their mature size at one age while others attain maturity at earlier or later ages. But, by the age of sixteen or seventeen years, the different parts of the body have, for the most part, assumed their mature proportions, and the individual is similar in appearance to an adult.

Proportions of the Head.—The head grows proportionately less after birth than most other parts of the body because it has to grow less to attain mature size. At birth, the length of the head is 22 per cent of the total body length. If these proportions remained constant, a mature man of six feet would have a head of about 16 inches in length instead of the average of 8 or 9 inches, thus resulting in a real monstrosity. From birth to maturity the length of the head doubles but the total stature is $3\frac{1}{2}$ times that at birth. Increase in head length is due mostly to increase in facial proportions, as the cranial or upper portions grow

little from birth to puberty and none afterward. At the first month, the circumference of the head is two-thirds of that at three years; at six years, 90 per cent of adult size; and at twelve years, 95 per cent of adult size. At every age, the proportions of the head of a boy are greater than those of a girl.

Proportions of the Face.—The accompanying diagram of the bony framework of the head shows the changes in proportions that take place before mature proportions are attained. Because the upper part or cranium completes its growth so early, the head has a disproportionate



FIG. 20.—Characteristic profiles at six and seventeen years of age. (From L. Cole, *Psychology of adolescence*. Farrar & Rinehart, 1936.)

look. The top of the head appears to be too large for the face. The lower part of the head throughout babyhood and early childhood is small and undeveloped owing, primarily, to the lack of teeth at first and later to the smallness of the baby teeth. The facial skeleton becomes larger in proportion to the cranium from birth to seven years, thereby eliminating the "babyish look." Until the second or "permanent" teeth have replaced the tiny baby teeth—and this is not until shortly before puberty—the mouth, chin, and entire lower part of the child's head are small compared with the upper part where the brain development has progressed more rapidly. The forehead flattens, the lips fill out, and the face becomes oval instead of round as the child approaches puberty.

The *nose* is one of the most disproportionate of the facial features. For the first few years of life, it is small and rather flat on the face. Gradually, as the cartilage framework develops, the nose not only becomes larger but it also assumes a more definite shape. By the age of thirteen or fourteen years, the nose has attained its mature size, and the hairs of the nostrils have become thicker and stronger, especially in

boys. This early maturing of the nose is apt to arouse much distress on the part of the adolescent, who believes that his face will be distorted throughout life because the nose is disproportionately larger than the other features. The changes that occur in the face from childhood to maturity are illustrated in Fig. 20.

Proportions of the Trunk.—The "top-heavy" development of the baby militates against good balance, and this must be corrected before the baby can sit, stand, or walk. The change in proportions which is essential to good balance comes from a gradual lengthening of the *trunk* and *legs*. Up to the age of six years, the trunk is twice as long and wide as it was at birth. From then until adolescence, the increase is approximately 50 per cent. By maturity, the birth dimensions are trebled. The thickness of the trunk at maturity is not quite $2\frac{1}{2}$ times that at birth. The protruding abdomen, so characteristic of the small baby, flattens out from about the third year, and the shoulders become broader, resulting in a more triangular shaped body than is usually found in babies.

During early adolescence, the *chest* deepens and becomes longer. The greatest increase in girth comes from fourteen to seventeen years in boys and from twelve to fifteen years in girls. The pelvis which, during the first years of life, showed no distinct difference between the sexes, shows a striking difference in early adolescence. In girls, the pelvic arch broadens, and this results in the enlargement of the body circumference in the area of the hips.

Proportions of Arms and Legs.—At birth, the *legs* of the infant are proportionately too short, the *arms* too long, and the hands and feet too small. Growth at different rates must therefore occur before mature proportions are attained. The length of the *arms* and *hands* increases between 60 and 75 per cent from birth to two years. At the age of eight years, the arms are nearly 50 per cent longer than at two years. At this time, they are very thin, with no marked development apparent in the musculature. This is responsible for giving the child the spindly, "all-arms" look so characteristic of that age. (From eight until sixteen or eighteen years, the growth in the length of the arms is slow, while development in the shape, owing to increase in musculature, is taking place. This occurs to a marked degree during puberty and is more pronounced in boys than in girls.)

From birth to two years, the *legs* grow 40 per cent, and at eight years, they are 50 per cent longer than at two years. Thus the legs grow at a slower rate at first than do the arms. By adolescence, they are four times as long as at birth and at maturity, five times as long. As is true of the arms, the legs of the child are thin and spindly until puberty. Then, as the increase in length slows down, there is a growth in the

muscular development which results in a marked change in the shape of the legs.

The *hands* and *feet* of the newborn infant are very tiny. Before they can be used, there must be an increase in size as well as muscular development. And the first two years of life are marked by rapid growth in both hands and feet. From then until puberty, growth is slow and, at that age, mature size is attained. By fourteen years, they are as large, or nearly as large, as they ever will be. To the boy or girl unfamiliar with the laws of growth, this is often a source of mental anguish. Many girls wear too tight shoes in the hope of checking the growth of their feet, and this is responsible for many of the serious foot disorders found in mature years. As nothing can be done to check the growth of the hands, the self-conscious adolescent tries to hide them by holding them behind his back or in his pockets.

THE BONES

Development in the bone structure of the child consists of growth in the size of the bones, increase in the number of bones, and change in the texture of bones. Although the bones grow in length and size from early in the prenatal period, the period of most rapid growth is during early adolescence. The gain in weight for girls from the twelfth year, and for boys from the fourteenth year, is chiefly in bone weight. The skeleton makes up nearly one-fourth of the entire body weight by the age of sixteen years.

The long bones of the arms and legs grow at the ends during puberty, but the ends do not become firmly united with the shaft of the bone until several years after puberty. The pelvis bone shows a marked difference in boys and girls at puberty. In girls, the pelvic arch broadens and the transverse diameter becomes greater than the anterior-posterior diameter. Accompanying this change is a muscular growth and a disposition of fat under the skin. This results in the enlargement of the circumference of the body in the area of the hips by several inches. Changes in the bone structure of the face often bring about marked changes in the child's face. When these changes occur, it is not uncommon to find that the child resembles the parent other than the one first resembled.

Number and Condition of Bones.—At birth, there are 270 bones. By the age of fourteen years, the number of bones has increased to 350. Instead of a further increase, there is a decrease in the number of bones in the body after puberty, so that by the middle of life, there are fewer than at birth, about 206. Roentgenograms, or X rays, of the wrist bones of a child illustrate this phase of bone development. At the age of two years, there are 2 or 3 wrist bones apparent; at 6 years, 6 or 7

bones; while between twelve and fifteen years, the eighth bone appears. Figure 21 shows the development of bones in a male child at the ages of two, six, and sixteen years.

In the early months of postnatal life, the bone tissue is soft and spongy. Cartilage or membrane occurs in some places where there will later be bone. In some areas of the skeleton there are separate pieces of bone which will later fuse into one bone. In over 50 per cent of all babies, the fontanelles are closed by the age of eighteen months and in nearly all by two years. In girls, the closing occurs sooner than in boys. The spine at birth is soft and thus easily distorted because it is made of cartilage. From one-half to two-thirds of the entire growth of the vertebrae occurs during the first three years of life.



FIG. 21.—Bone development in the hands of a male child at two, six, and sixteen years (From C. D. Flory, *Ossification development in the hand as an index of skeletal development*. *Monogr. Soc. Res. Child Developm.*, 1936, 1, No. 3.)

Because the bones are soft at first, the baby's body is pliable and he can get into strange positions without difficulty, such as sucking his toes when lying on his back. In addition to this, the bones are liable to be deformed, because of pressure, unless care is taken. The shape of the head can be flattened if the baby is allowed to sleep for too long a time on his back, or the chest will be flattened if he spends most of his sleep time on his stomach. Even in the elementary-school years, bone deformities result from too short shoes or from sitting in a cramped posture at a school desk.

Ossification.—Ossification, or hardening of the bones, is entirely postnatal, beginning at the early part of the first year and ending shortly before puberty. Ossification takes place gradually, due to calcium, phosphorus, and other mineral salts which are introduced into the bone

structure. There is a gain of 60 per cent or more of mineral matter in the bones during the process of ossification. Ossification proceeds at different rates in different parts of the body. In girls, it is completed about two years sooner than in boys.

THE TEETH

The child has two sets of teeth, the "baby," or temporary, teeth and the permanent teeth. These two sets differ in several important respects: (1) There are 20 temporary teeth and 32 permanent ones. (2) The temporary teeth are smaller than the permanent ones. (3) The permanent teeth are of better quality and therefore more durable.

The growth of teeth is a continuous process from the fifth prenatal month, when the teeth begin to form in the jaw, until the wisdom teeth reach their full size, between the ages of twenty-one and twenty-five years. The eruption of the temporary teeth is accompanied by discomfort or actual pain, often causing the baby to lose his appetite and become irritable and nervous. Permanent teeth, for the most part, cut through the gums without any appreciable discomfort. The psychological significance of their appearance, so far as the child is concerned, is that each new tooth is further evidence that he is emerging from babyhood into a more mature state, and, as a result, he begins to assert himself or demand rights not previously given him.

Temporary Teeth.—The first one of the temporary teeth makes its appearance between the third and sixteenth months, with the average age of appearance between the sixth and eighth months. In Fig. 22 are given the average ages at which the 20 temporary teeth appear.

The lower teeth, as a rule, erupt before the upper teeth. The time of eruption is variable and depends upon health, nutrition before and after birth, social status, race, and other factors which influence the baby's development. Generally, girls' teeth erupt slightly earlier than boys' teeth, and likewise they are shed at an earlier age to make way for the second or permanent set of teeth.

Permanent Teeth.—Even after the temporary teeth have erupted, much activity goes on inside of the gums as the permanent teeth, except the four wisdom teeth, begin to calcify. The order of calcifying, is the same as the later order of eruption. In Fig. 22 are given the ages of eruption of each of the permanent teeth.

On the average, the child at the age of six years has 1 or 2 permanent teeth; at eight years, 10 or 11 teeth; at ten years, 14 or 16; at twelve years, 24 or 26; and at thirteen, 27 or 28. At every age, girls are ahead of boys in the number of permanent teeth that have erupted. The last four of the permanent teeth, the "wisdom teeth," erupt between the ages of seventeen and twenty-five years, if they appear at all.

The relation of appearance of permanent teeth to the mental age of the child was studied by Cohen and Anderson (1931) in the case of 218 children, ages five to fifteen years, from a school for feeble-minded.

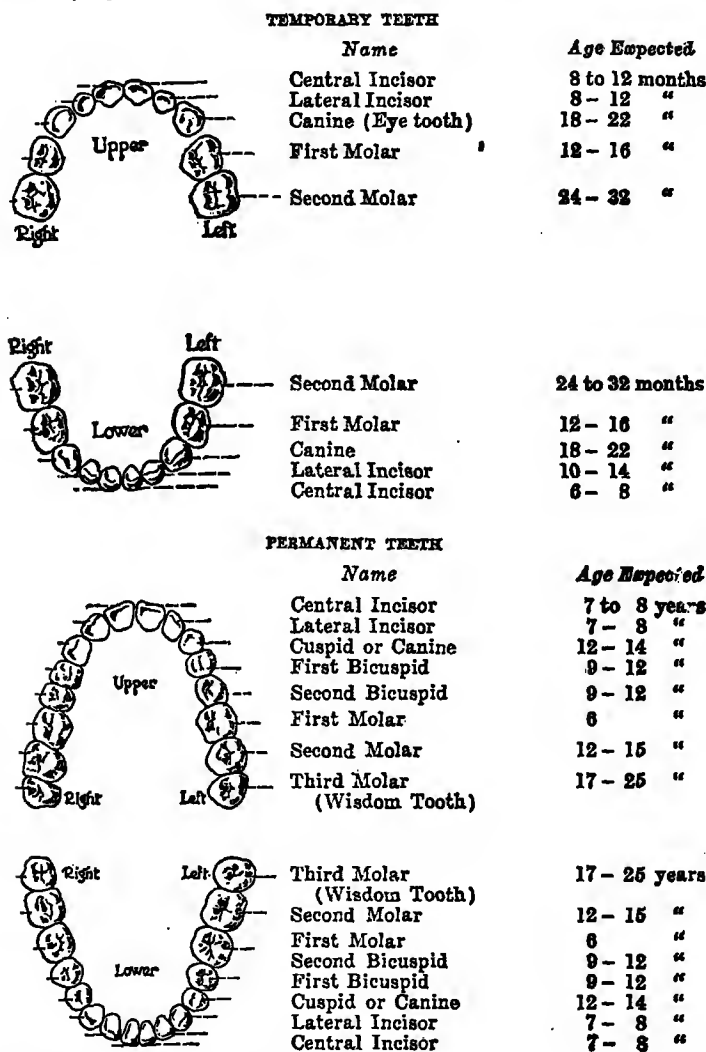


FIG. 22.—Eruption of temporary and permanent teeth. (Chart from J. Anderson and F. Goodenough, *Your child year by year*, *Parents' Magazine*, 1930. Courtesy *Parents' Magazine*.)

It was found that at all ages, the subnormal children had fewer teeth than the normal. Each of the teeth of the normal child erupted somewhat earlier than the corresponding teeth of the subnormal. The difference in age was least marked in the anterior and most marked in the

posterior teeth. Permanent laterals were more often found to be congenitally missing in the defective than in the normal groups.

THE MUSCLES

Increase in weight at all periods of growth is due to the development of two types of tissue, *adipose* and *muscle tissue*. In the early years of childhood, the development of adipose tissue is more rapid than that of muscle tissue but, from the ages of twelve to fifteen years in girls, and from fifteen to sixteen years in boys, there is a marked increase in muscle tissue. The proportionate weight of the muscles to the body weight increases rapidly at that age as can be seen by the fact that at birth the muscles weigh 23.4 per cent of the total body weight; at eight years, 27.2; at fifteen years, 32.6, and at sixteen years, 44.2. Thus, growth of the muscles in proportion to body weight is slow in childhood and rapid after puberty.

The marked increase in muscle weight after puberty is one of the secondary sex characteristics which accompanies the onset of puberty. The circumference of the forearm, upper arm, calf, and thigh increases because of muscular development. The trunk rounds out, owing partly to adipose tissue and partly to muscle growth in the back and shoulders. The muscles become thicker and longer at this age. At maturity, they are five or more times as thick as at birth. The composition of the muscles changes from 72 per cent water and 28 per cent solid matter to 66 per cent water and 34 per cent solid matter. Consequently, the muscles become firmer and stronger. Tests have indicated a tremendous increase in muscular power and strength during this period. This is especially apparent in the strength of grip tests.

Adolescent Awkwardness.—The awkwardness of the early adolescent years, so characteristic that it is responsible for the name, the "awkward age," is brought about by the rapid growth in musculature, the tendency for the muscles to grow in length more rapidly than the bony framework of the body, the slow development of neuromuscular patterns, and the disproportionate growth of the muscles and bones. This leads to faulty posture and uncertain coordination. It generally takes several years for the adolescent to acquire muscular coordination, following a period of nervousness, squirming, pulling at neckties, and twisting buttons. As muscular control develops, repose also develops.

DEVELOPMENT OF THE NERVOUS SYSTEM

The growth of the nervous system is very rapid before birth and in the first three to four years after birth. Growth during the prenatal period, as was pointed out in the chapter on prenatal development, consists primarily of increase in the number and size of nerve cells. During the

postnatal years, on the other hand, growth consists primarily of the development of immature cells present at birth, rather than the formation of new cells. After the age of three or four years, growth of the nervous system proceeds at a relatively slow rate.

The Brain.—Brain growth cannot be studied directly, but must be estimated from studying the brains of the dead or from external measurements of the cranial development of living children. These measurements show that brain growth is very rapid from birth to four years, slowing down between the ages of four and eight years, and then progressing very slowly until approximately the age of sixteen years, when the mature size of the brain has been attained. Since the bones of the skull are loosely connected by membranes during the first few months of life, ample space is left between the edges to allow for growth.

At birth, brain weight averages 350 grams as contrasted with adult weight, which ranges from 1,200 to 1,400 grams. One-fourth of the adult brain weight is attained by birth, one-half by the age of nine months, three-fourths by the end of the second year, four-fifths by the fourth year, and 90 per cent by the age of six years. To show how rapidly the brain grows in early childhood as compared with the latter part of childhood, it is interesting to note that at birth, brain weight is one-eighth of body weight; at ten years, one-eighteenth; at fifteen years, one-thirtieth; and at maturity, one-fortieth.

Even though the increase in the size of the brain is very slight during adolescence, owing to the fact that at the beginning of that period it has nearly attained adult weight, there is nevertheless continuation of development in the cortical tissues. By the eighth year, the brain is nearly its mature size but the development of intercerebral association tracts and the building up of gray matter is far from complete. Development is thus internal and cannot be measured in terms of size or weight.

CHANGES IN INTERNAL ORGANS

The increase in the size and weight of the child, during the growth years, is not due to the development of muscles or fatty tissue alone. The different internal organs, connected with respiration, circulation, and digestion, are growing rapidly at this time, and this growth is partially responsible for the child's increased weight. A brief description of the development of the *respiratory, circulatory, and digestive systems* will show when these different types of development occur:

Respiratory System.—The *lungs* at birth are small, as may be seen by the fact that the chest circumference at that age is smaller than the head circumference. By the age of two years, the circumference of the head and chest are the same; at fifteen years, the ratio of head and chest is 2 to 3, and at maturity, 3 to 5. The final shape of the chest

is reached between the twelfth and thirteenth years. After that, the change is in size alone.

Throughout the adolescent years, the lungs increase in volume and weight. While the growth is especially pronounced right after puberty, during the early adolescent years, it nevertheless continues until the close of adolescence. Accompanying the growth of the lungs is an increase in the breathing capacity that is especially apparent just before and during puberty. At the age of seventeen years, girls, on the average, reach their adult vital capacity, while, in the case of boys, this does not occur until several years later.

Circulatory System.—The heart, at birth, is higher in the chest, more horizontal in position, heavier, and larger in relation to body weight than at any other time in life. Just before puberty, its relationship to body weight is less than at any other time, while during adolescence there is an increase in relation to body weight. The muscle fibers of the heart increase in size and in number of contractile fibers during adolescence.

In early childhood, the heart is small while the veins and arteries are large; in adolescence the reverse is true. The veins are smaller in relation to the arteries in childhood than later. The blood vessels grow in length and area of cross section during adolescence, and the walls become thicker and of stronger texture. The result is that blood pressure is low in childhood and gradually increases in the beginning of puberty, owing to the increase in ratio of heart volume to size of the aorta. The pulse rate ranges between 120 and 140 in the early years of life as contrasted with the normal of 72 in adults.

In adolescence, the ratio between the width of the heart and the arteries is 5:1. The significance of this is that the heart pumps blood into an opening only one-fifth as wide as itself. This causes strain on the heart and increase in blood pressure. Strenuous exercise during early adolescence, when the circulatory system is undergoing such pronounced changes, is apt to cause faintness, dizziness, headaches, palpitations, heart strain, valvular heart diseases, or enlargement of the heart. This is especially serious for boys because strenuous athletics in high school are engaged in, at this time, while girls, on the other hand, have usually passed through the puberty changes, when they enter high school.

Digestive System.—In the baby, the stomach is tubular in shape, lies transversely in the body, and has a very small capacity. At birth, the capacity is about 1 ounce; at two weeks, it has increased to $2\frac{1}{2}$ ounces; and, by the end of the first month, to 3 ounces. This contrasts with the baglike shape of the adult stomach, which not only holds a larger amount of food but which also empties more slowly. Because of the transverse position of the baby's stomach, it empties quickly, espe-

cially when the baby lies on his right side or is held in a semierect position. Throughout the childhood years, the stomach empties more quickly than in adult life.

The rapid physical growth of the adolescent, combined with the great muscular activity characteristic of this age, requires a tremendous food supply, fuel for both growth and body repair. The typical adolescent is constantly hungry and eats at all hours of the day or night. Studies in preparatory schools have shown that the average food consumption for boys between the ages of thirteen and sixteen years is 5,000 calories daily. This is nearly half again as much as a manual laborer of mature years requires. The seemingly unlimited food capacity, together with the craving for sweets which have high caloric value, is normal at this age.

In spite of the high caloric intake, however, the adolescent remains relatively thin, as the food consumed is converted into energy for active sports and growth. When fatness occurs in the early adolescent years, it can usually be traced to a glandular condition rather than to overeating. Eating habits, established during these years when there is a physiological need for large quantities of food, prove, in time, to be a source of trouble for the adult if he wishes to avoid digestive disturbances and obesity.

THE SEX APPARATUS

Puberty.—Puberty, a term derived from the Latin, "pubertas," meaning "to beget," is the name given to the period of development when sexual activity awakens as an accompaniment to the beginning of functioning of the reproductive organs and the appearance of the secondary sex characteristics. It is not synonymous with "adolescence," which is applied to the period of development extending over a number of years beginning with puberty and continuing until sexual maturity is complete. Puberty is a period of change from asexual to sexual life. During this period, marked bodily changes occur which are accompanied by a state of emotional stress and strain, characterized by unrest and uncertainty.

Individual Differences.—There are pronounced *individual differences* in the ages which mark the onset of puberty. The range is from the twelfth to the seventeenth year, with an average age of $13\frac{1}{2}$ years for girls and $14\frac{1}{2}$ years for boys. The length of the period required for the change from asexual to sexual life is approximately six months to one year for boys and slightly less for girls. The age of pubescence varies not only with the sex of the individual but also with differences in intelligence, and social and economic status.

The relationship between *intelligence* and age of puberty has been studied by a number of investigators. Lutz (1924) reports that in the case of boys studied by him, the earlier pubescent group had I.Q. scores

ranging from 110 to 169, while those whose I.Q. scores fell below 90 were retarded in pubescence. The mentally superior boys reached puberty at 12.5 years, the normal boys at 13.5 years, and the dull at 14.5. Terman's (1925) study of gifted boys and girls showed that the gifted attained puberty earlier than the nongifted. Girls of superior intelligence menstruate first at an earlier age than girls of average or dull intelligence. Boys of superior intelligence experience an earlier change in voice and appearance of hair on the body than do boys of lower intellectual rating.

Abernethy (1925), on the other hand, found no evidence to show that early maturing was related to more rapid mental development in the case of 359 students in the University of Chicago Laboratory Schools. There was found to be, however, a marked superiority in the physical development of the physiologically mature girls as well as in their social development, as shown by ability to make social adjustments.

Similarly, children from the upper *social* and *economic classes* mature one or two years in advance of those from the poorer classes. Children of large stature as a rule mature earlier than children of the same chronological age whose stature is smaller. As individual differences in the age of puberty are thus commonly found, it is essential to consider this fact when studying the mental or physical development of the individual child as approaching the age of puberty.

Criteria of Puberty.—One of the first noticeable signs of puberty is a rapid increase in height and weight in a short time. Both boys and girls seem to "shoot up" and quickly outgrow all their clothing. At the time when puberty is actually attained, and when sexual changes are occurring, growth slows down for a short time, to be followed by a rapid spurt and numerous changes in the body.

The specific *criteria* used to determine whether or not the child is pubescent are dependent upon the sex of the child. In the case of boys, the downy pubic hair gives way to a thicker, kinkier type, hair appears in the armpits, the beard begins to grow, and the voice changes from a high to a low pitch, with temporary loss of control over the pitch, resulting in "cracking." These three characteristics of adolescent development should be present in boys, on the average, between the ages of 14½ and 15 years.

Pubescence is more precisely dated in girls than in boys because of the first appearance of the menstrual flow at that age. The average age for the first menstrual flow is 13 years 6 months, to 13 years 9 months. In addition to this criterion, puberty in girls is marked by the enlargement of the breasts, the appearance of subcutaneous fat, and finally the growth of hair in the armpits.

Puberty Changes.—During puberty, marked physiological changes occur, caused primarily by the action of the sex glands, or gonads, which,

until this time, have been more or less dormant, partly at least, as a result of being held in check by the thymus gland in the chest and the pineal gland at the base of the brain. Shortly before puberty, the sex glands are stimulated partly by the pituitary gland, located at the base of the brain, and they in turn disseminate hormones into the blood which speed up the growth and development of the sex organs and of the body as a whole.

The two important physical changes which result consist of (1) the growth of the reproductive organs and (2) the development of the "secondary sex characteristics," the physical structures which accompany sexual maturity but are not directly related to reproduction.

1. The Reproductive Organs.—In childhood, the reproductive organs grow slowly and are functionally immature. During puberty, they develop rapidly, become functionally mature and are sharply differentiated in the two sexes. In girls, growth of the reproductive organs consists of enlargement of the external genitalia, increase in the size of the ovaries and uterus, and the ripening of the ovarian follicles which form the ova. It takes a number of months for this development to be completed and the appearance of menstruation signifies the onset of puberty.

In boys, the genitalia grow rapidly in puberty, and the testes, which become functionally active at this time, are now capable of secreting spermatozoa. A nocturnal emission of semen occurs at more or less frequent intervals. Unless the boy has been warned ahead of time to expect this, it may prove to be an embarrassing experience resulting in the development of an unfavorable attitude of shame and secretiveness.

2. Secondary Sex Characteristics.—In addition to the development of the sex organs proper, a number of physical changes related indirectly to reproduction occur. In boys, the most important of the secondary sex characteristics consist of the growth of the beard, the appearance of a thick, kinky hair on the genitalia, and in the armpits, a coarsening of the texture of the skin, the development of the muscles, and a change in voice. The important secondary sex characteristics of girls include the growth of a light down on the upper lip and chin, the growth of hair over the body, especially on the genitalia and in the armpits, the appearance of subcutaneous fat on the body, enlargement of the breasts, coarsening of the skin, the growth of muscles, and change in voice. These changes come several months before the first menstrual flow.

Of these secondary sex characteristics which appear during puberty, two, the changes which occur in the *voice* and *skin*, need additional description. The vocal cords of the boy almost double their length during the adolescent years. The result is that there is a change in pitch from high to low. The larynx also shows a decided increase in size at

this time. The "Adam's apple" becomes prominent and protrudes from the neck owing to the enlargement of the vocal organs. While these changes are taking place in the vocal organs, the voice is no longer under perfect voluntary control. The result is that it "breaks" or becomes hoarse without any warning. In girls, the change of voice is not so conspicuous as in boys: it is marked by an increase in fullness and richness rather than a pronounced change in pitch.

The period of change in voice, for both boys and girls, lasts for nearly two years. During the first part of this period, there are many embarrassing experiences resulting from the fact that the adolescent never knows what his voice will sound like when he begins to talk. Consequently, he talks as little as possible in school or in groups, preferring to pretend that he is unprepared for recitation rather than to run the risk of being laughed at by his classmates when his voice breaks.

The delicate, fine-textured *skin* of the little child becomes coarser in early adolescence owing to an enlargement of the pores. Faulty eating habits so common at this age, combined with glandular changes and digestive disturbances, cause the breaking out of eruptions, or "pimples," a shiny skin, and blackheads. To the adolescent boy or girl, these skin disturbances are the source of much mental torture, and many adolescent girls seek every beauty aid they can afford to rid themselves of this condition. Fortunately, in most cases, these skin disturbances are only temporary.

Excessive perspiration is very common at puberty in both boys and girls and, like the skin eruptions, is the source of much mental anguish on the part of both boys and girls, who are afraid of body odor. This fear has been intensified in recent years by advertisements for soaps and deodorants which stress the fact that the individual who suffers from "B.O." is rarely conscious of it. Advertisements of this type lead to large sales among adolescents who buy all sorts of soaps and deoderants with the hope of checking their tendency to perspire profusely.

Psychological Effects of Puberty.—While the body is going through pronounced physiological changes, the *mental attitude* of the adolescent is likewise changing markedly. Invariably, the adolescent feels important because of his mature development and expects rights and privileges not accorded to him as a child. Great anxiety, often reaching the state of acute fear, accompanies the first menstruation unless the girl has been warned ahead of time as to what to expect. The seminal emissions at night are the cause of pronounced worry on the part of the growing boy, partly because no one has warned him to expect them and partly because he has heard or read about "lost manhood" which, he now believes, is in some way or other associated with the experiences he is having.

Anxiety is not limited to these experiences alone. The *awkwardness* so characteristic of this age leads to self-consciousness in the presence of others and a consequent desire to avoid other people as much as possible. The rapid growth of hands, feet, and nose, the breaking out of pimples and blackheads on the skin, uncertainty as to how the voice will sound during the "cracking" period, and, finally, the straggling growth of hair on the boy's face, which too often is the source of good-natured teasing on the part of adults, all intensify an already existing attitude of discomfort and worry. Perhaps at no other time during the growth years are the psychological reactions of the individual so closely bound up with and dependent upon the physical changes which are taking place as they are at this age.

It is not unusual to find marked changes in *disposition* and *temperament* during puberty, especially in the case of boys and girls of the nervous, high-strung type. Attitudes of dissatisfaction, restlessness, revolt against authority, and the belief that the world is against them, are all very common. This dissatisfaction often leads to threats to leave home or commit suicide, few of which, fortunately, are ever carried out. Charlotte Bühler (1928), in a study of 50 girls in a "shelter" in Vienna, found that during a period of two to nine months before menstruation occurred, all of the girls she studied passed through a phase of restlessness and uneasiness. There was a tendency for the girls to isolate themselves from the others. This phase ended abruptly, following the onset of menstruation, after which ordinary social relationships were resumed.

Accompanying puberty there is an abandonment of childish interests. This is seen especially in the case of play activities which lose favor as the boy or girl matures sexually. The preadolescent, who shows distinct preference to being alone rather than to being with his friends, generally spends his time reading, daydreaming, or moping. It is during this time that he has an opportunity to think about matters, and as a result he very often comes to the conclusion that he has been badly treated, that no one loves him, and that life is not worth living.

The close relationship between the physical changes of puberty and the mental changes that accompany them is exhibited in studies of abnormal adolescent development. When, as a result of disease, glandular deficiency, or operations on the sex organs, normal physical sex changes do not occur, the normal psychological changes described above also do not occur. Castrated animals, likewise, remain immature, both physically and mentally, even though old enough to have attained complete maturity. In the opposite direction, medical studies of puberty praecox, where there is a premature functioning of the gonads, show that precocious physical sex development is accompanied by precocious changes in mental attitudes.

DISEASES

Importance to Personality.—Diseases during the growth years are serious not only because they retard physical growth but also because they hinder personality development and tend to develop undesirable personality traits. It is usually not the illness itself that is responsible for the personality disturbances but the fact that during illness the child is pampered and the routine of his life and responsibilities temporarily abandoned. Should the illness last for several months, the child will not only be thoroughly "spoiled," unless marked precautions are taken to avoid it, but he will also find it difficult to readjust himself to his former playmates who have learned much about social adjustment during the time the child was ill. The result is apt to be an unfavorable social attitude and the establishment of solitary play habits.

Periods of Susceptibility.—There are certain times, during the growing-up years, that are characteristically healthy, just as there are others that are characteristically unhealthy. During babyhood, diseases are frequent and often fatal. Diphtheria and pneumonia are the most serious illnesses at this age. Susceptibility to disease is very marked from three to six or eight years of age. Unless carefully segregated from other children, most boys and girls at this age are subject to a series of quarantines for different childhood diseases, as mumps, measles, chickenpox, whooping cough, scarlet fever, and diphtheria.

Normally, the period from six or eight years to the onset of puberty is a very healthy age when physical strength and endurance are adequate to permit the boy or girl to engage in active play for hours at a time without any noticeable fatigue. Following the healthy period of late childhood comes the period of puberty, which is marked by many physical disturbances, few of which are fatal. Owing to the pronounced body changes occurring at this time, the body is more susceptible to upsets and diseases than at other times. The common physical disturbances accompanying puberty are indigestion, headaches, nervousness, eye troubles, heart troubles, skin eruptions, nosebleeds, anemia, general fatigability, changes in urea, and poor sleep.

CHAPTER VI

MOTOR DEVELOPMENT

One of the most rapid forms of development taking place during the early years of life is that of control over the different muscles of the body. From the helpless infant who cannot move his body from the place where he has been laid, or who cannot reach for and grasp an object held out to him, the young child emerges, in the period of a few short years, to a phase in which he is relatively independent of others.

Motor development consists of control of the movements of the muscles which, at birth and shortly afterward, are random and meaningless. But gradually, as the baby develops control over his muscular mechanism, specific pattern responses replace the earlier type of random movements. Instead of movements by the entire body, which occur in mass activity, only certain muscles or teams of muscles respond, and thus the energy expended is greatly reduced. Every child must develop effective coordination of his muscular mechanism if he is to emerge from the state of helplessness that is characteristic of the first months of life.

The development of muscle control is dependent upon a balance between contraction and relaxation of antagonistic muscles. As many of the muscles of the body are arranged in pairs, so that when one contracts the other relaxes or extends, the child must acquire the ability, partly through practice and partly through maturation, to bring about a proper relationship between the contracting and relaxing phases of the paired muscles. Should both contract with equal tension, immobile rigidity occurs, while simultaneous relaxation of both muscles results in no motion.

During the first five years of life, the most important development along motor lines consists of an elaboration of native reactions into motor skills of the sort that will prove to be useful to the child throughout life. After the foundation skills, such as self-feeding, dressing, walking, and running, have been established, the more complicated skills, as writing, playing the piano, skating, and dancing, are built up. The earlier in the child's life that motor control is brought about, and the earlier the necessary skills are established, the better. Because the young child is more plastic than the older one, and because he has fewer skills to interfere with his learning, he can develop skills more quickly and easily than will be possible as he grows older. Likewise, his desire to learn motivates

him to practice an activity until it is mastered, while an older child or adolescent is apt to become impatient if learning does not take place quickly.

METHODS OF STUDYING MOTOR DEVELOPMENT

Scientific studies of motor development have been made from day-to-day records of individual babies, kept in the form of baby biographies, from observational studies of groups of babies and young children, and from intelligence-test records. The results obtained from biographical studies of babies, Hurlock and McHugh (1936) found, were not satisfactory because baby biographies for the most part relate to babies of superior intelligence, and therefore data obtained from them do not hold for babies of average intelligence. In general, baby biographies tend to show an earlier development of motor coordination than do the observational studies or intelligence-test records of large groups of babies.

Observational studies of large numbers of children, in carefully controlled situations and often supplemented by moving pictures, have proved to be far more satisfactory than biographical records. These studies have been of two types, *normative* and *analytical*. Normative studies aim to determine the average, or median, age at which different phases of motor development occur for children as a whole. Analytical studies, on the other hand, are concerned with characteristics of motor development rather than the age at which different aspects of motor development occur. Many of the studies, especially the recent ones, combine both approaches. This may be seen in Burnside (1927) and Ames's (1937) studies of locomotion, contrasted with Gesell's (1928) normative summaries of motor development.

CHARACTERISTICS OF MOTOR DEVELOPMENT

Motor development does not occur in a haphazard fashion but rather in an orderly, predictable manner, as was pointed out in Chap. II. It follows a definite sequence in which control occurs first in the head, then in the arms, hands, and upper part of the trunk, later in the lower part of the trunk, and finally in the legs and feet. This head-to-foot, or *cephalocaudal*, sequence is referred to as the "law of developmental direction." It is interesting to note that the sequence of muscle control is similar to that of prenatal development of structure in which the head is more developed than the legs. Development also proceeds in the *proximodistal* direction, which means that motor development occurs earlier in the structures lying nearest to the main axis than in those in a more remote area. Muscle control, for example, appears sooner in the arms than in the fingers.

Pattern of Motor Sequence.—The motor sequence was first observed by baby biographers, who reported definite patterns in the development of motor control in babies. More recently, experimental studies of groups of babies have shown a pattern of development similar to that reported by the biographers but developing at a slower rate. An example of this is Shirley's (1931a) study in which she collected data from weekly examinations of 25 babies from birth to two years of age. These data showed that eye coordination occurred first, following which came postural control, first in the head region and later in trunk, and finally came coordination of leg movements which led to creeping, crawling, standing upright, and then walking.

TABLE IX.—THE MEDIAN AND QUANTILES AND SEMIINTERQUARTILE RANGE FOR EACH STAGE OF MOTOR DEVELOPMENT

Description of stage	Number of cases	Age, weeks			
		Q ¹	Median	Q ³	Q
First-order skills:					
On stomach, chin up.....	22	2.0	3.0	7.0	2.5
On stomach, chest up.....	22	5.0	9.0	10.0	2.5
Held erect, stepping.....	19	11.0	13.0	15.0	2.0
On back, tense for lifting.....	19	14.0	15.0	18.0	2.0
Held erect, knees straight.....	18	13.0	15.0	19.0	3.0
Sit on lap, support at lower ribs and complete head control.....	22	15.0	18.5	19.5	2.2
Second-order skills:					
Sit alone momentarily.....	22	20.5	25.0	26.0	2.7
On stomach, knee push or swim..	22	22.0	25.0	27.0	2.5
On back, rolling.....	19	25.0	29.0	32.0	3.5
Held erect, stand firmly with help.	20	29.0	29.5	33.0	2.0
Sit alone one minute.....	20	27.0	31.0	34.0	3.5
Third-order skills:					
On stomach, some progress.....	17	32.5	37.0	41.0	3.7
On stomach, scoot backward.....	16	34.0	39.5	45.5	5.7
Fourth-order skills:					
Stand holding to furniture.....	22	41.0	42.0	45.0	2.0
Creep.....	22	41.0	44.5	45.0	2.0
Walk when led.....	21	37.5	45.0	45.5	4.0
Pull to stand by furniture.....	17	42.0	47.0	49.5	3.7
Fifth-order skills:					
Stand alone.....	21	56.0	62.0	66.0	5.0
Walk alone.....	21	59.0	64.0	67.0	4.0

Source: SHIRLEY, M. M. *The first two years*. Minneapolis: Univ. Minn. Press, 1931, Vol. 1, p. 99. Quoted by permission.

In working out the developmental sequence based upon median ages at which different patterns of behavior appeared, Shirley found that five

distinct steps occurred in the developmental pattern. The five order stages in the motor development are summarized in Table IX.

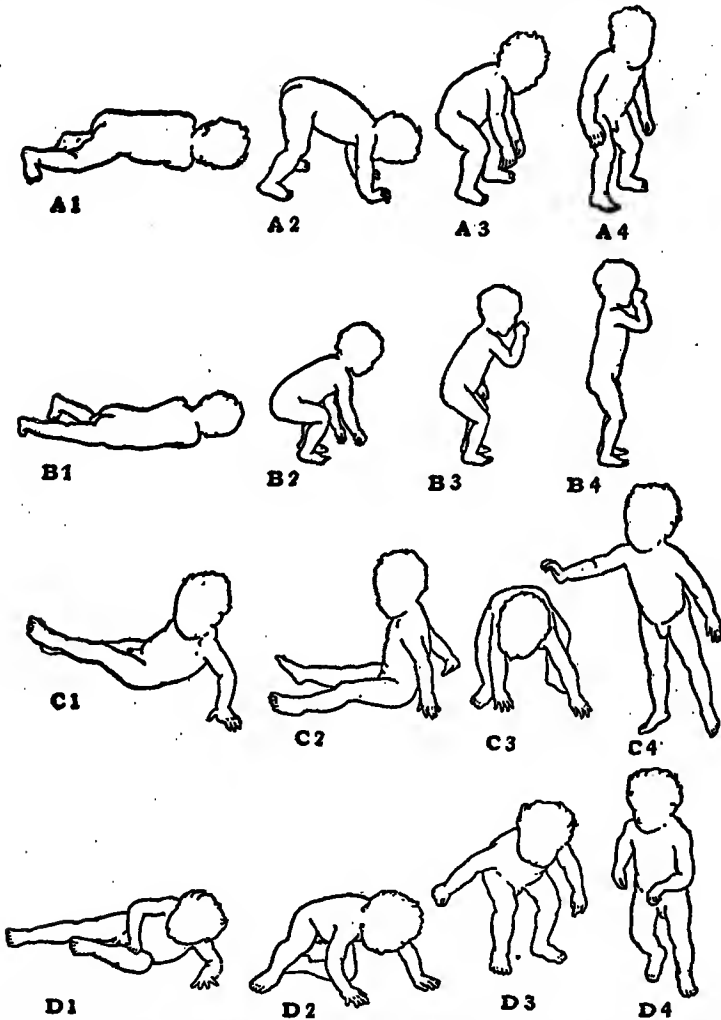


FIG. 23.—Developmental phases in the assumption of an erect posture. (From M. B. McGraw, *Growth: a study of Johnny and Jimmy*. Appleton-Century, 1935.)

The way in which babies are held illustrates this developmental pattern very well. At birth and shortly afterward, the baby rests his head upon the shoulder or bosom of the person holding him, and, if held away from the body, the whole head must be supported. Shortly, with control over the neck and head muscles, support is needed only at the

nape of the neck, then at the shoulders, then in the back, and finally under the buttocks. The pattern of motor development is well illustrated in Fig. 23, showing the phases leading up to the assumption of an erect posture.

Individual Differences.—Even though motor development follows a pattern of sequence that is inflexible in its broader aspects, individual differences in the detail of the pattern occur. Owing to lack of opportunity for practice, the child may be behind schedule in developing control over his hands and, as a result of encouragement or aid, ahead of schedule in walking. The whole pattern of development may be completed earlier or later than the standard times, because of individual differences in intelligence, health, and other factors.

Maturation and Learning.—Development of muscle control comes partly as a result of maturation and partly from learning. It depends upon the maturation of neural structures, bones, and muscles, and a change in body proportions, as well as upon an opportunity to learn how to use the different muscle teams in a coordinated fashion. Before skilled movements can be learned, a state of maturity in the muscular mechanism of the child must exist. It is impossible to teach the child skilled movements until his nervous system is developed enough for him to profit from it. If teaching precedes maturation, time and energy will be wasted and interest on the child's part lost. The relative importance of maturation and learning has been discussed in detail in the chapter Principles of Development.

SEQUENCE OF DEVELOPMENT

Because of the mass of available experimental data relating to motor development, the material will be presented according to the "law of developmental direction" rather than according to chronological age. The material has thus been divided into the following topics: (1) motor development in the head region, (2) motor development of the arms and hands, (3) motor development of the trunk, and (4) motor development of the legs.

1. MOTOR DEVELOPMENT IN THE HEAD REGION

Control of the muscles involved in eye movements, smiling, laughing, and holding up the head develops very quickly when one considers the complexity of the behavior involved. *Eye coordination*, which is very poor during the first few hours after birth, improves so rapidly that, by the end of the fourth month, even the most difficult type of eye movements should be present in every normal baby.

Of the three types of eye coordination, horizontal, vertical, and circular, the horizontal appears first. Jones (1926) found that thirty-three days was the youngest age at which babies tested by her were able to follow a light horizontally, while by the 90th day all the babies tested were able to do so. The earliest appearance of vertical eye coordination came on the 51st day, while by the 110th day it was present in all babies. Circular eye coordination appeared first on the 51st day and was present in all babies tested by the 130th day.

Optic *nystagmus*, the response of the eyes to a succession of moving objects, as when one looks from the window of a fast-moving train, has been studied by McGinnis (1930) from daily observations with the aid of an elaborate apparatus for the measurement of eye movements. He found that optic nystagmus occurred the first time the baby opened his eyes in the experimental situation, which came during the first twelve hours after birth. Ocular pursuit movements appeared for the first time during the third and fourth weeks.

The *blinking* reflex, present at birth, can be called forth by touching the face near the eyes, the eyelashes, and the corner of the eye, or by allowing a current of air to strike the eyes. Later, this same response becomes voluntary and can be called forth in anticipation of the touch of an object as it approaches the eye. Jones (1926) found that voluntary blinking occurred first at the age of forty-six days, while by the 124th day it was present in all the babies she tested.

Reflex *smiles*, in response to some tactual, organic, or kinesthetic stimulus, appear as early as the first week of life. "Social" smiling, or smiling in response to a smile from another person, or to a clucking sound made by another, does not occur until later. Using a smile and a clucking sound as stimuli, Jones (1926) reported that the first social smiling appeared at thirty-nine days of age, while the response was present in all babies tested at the age of ninety days. This response has been used by many writers as a criterion for the beginning of social behavior.

The ability to *hold up the head* during the first 20 minutes of life was shown by a large percentage of the infants studied by Bryan (1930). If a baby of one month of age is supported in a prone position at chest and abdomen, he can hold his head erect in a horizontal plane; and, at the age of two months, he can hold his head above the horizontal plane at an angle of as much as 30°. Holding up the head when lying on the back is more difficult than in a prone position and, consequently, develops later. Shirley (1931a) reports that the median age is twenty weeks. When seated with suitable support on the lap of another, 75 per cent of the babies studied by Gesell (1928) could hold up their heads at the age of four months. By six months, nearly all were able to do so.

2. MOTOR DEVELOPMENT OF THE ARMS AND HANDS

From birth, the baby's arms and hands are in constant motion. At first, the movements consist of awkward jerks, random hittings, and opening and closing of the fingers. These movements occur even during sleep, though they are less frequent than when the baby is awake. The most common hand movement is toward the head, owing to the habit of position established during the fetal period. Sooner or later, by chance, the fingers touch the lips, producing a pleasurable sensation. This leads to a recurrence of the act and the establishment of the habit of thumb sucking, unless measures are taken to prevent it.

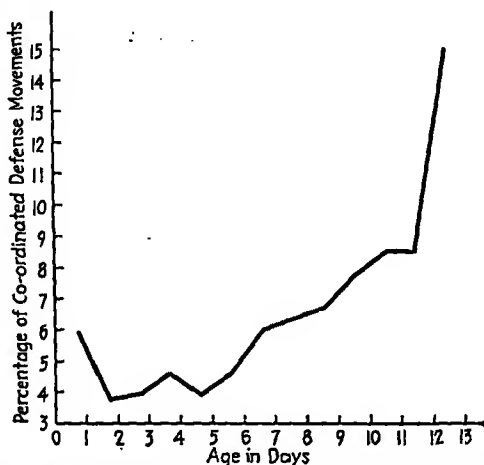


FIG. 24.—Percentage of coordinated defense movements of the arms, in response to pressure, according to age. (From M. Sherman, I. C. Sherman, and C. D. Flory, *Infant behavior. Comp. Psychol. Monogr.*, 1936, 12, No. 4.)

Defensive Coordinations.—Sherman and Sherman (1929) studied coordination of the arms and hands by eliciting defense reactions through continuous pressure with the finger on the baby's chin. The degree of perfection of coordination was measured in terms of the number of arm movements occurring in pushing away the examiner's finger. They found that between twenty and forty hours of age, an average of 11 arm movements was necessary before a coordinated movement was made (see Fig. 24). With increase in age, defensive arm movements became less irregular, but some babies as old as thirteen days could not make a perfectly coordinated movement in one trial.

Thumb Opposition.—In the grasping reflex, which appears at birth or shortly afterward, the thumb and fingers act together as a hook, by which the baby supports his weight when the stick he grasps is raised. Before the hand can become useful for purposes other than grasping, the

thumb must work in opposition to the fingers and thus function as a separate unit. *Thumb opposition* in grasping occurs, normally, between the third and fourth months and, in picking up objects, between the eighth and ninth months. Idiots do not use the thumb in opposition to the fingers because they cannot spread the thumb and first finger to the angle of 90° as the normal individual can.

Thumb opposition was studied by Gesell and Halverson (1936) by means of moving pictures. In the accompanying table are given the ages at which different postures of the fingers occurred in grasping a cube or ball placed on a table before the baby. Complete thumb opposition was found at ages ranging from thirty-two to fifty-two weeks.

TABLE X.—DIGITAL POSTURES IN GRASPING CUBE AND BALL

Thumb posture	Age, weeks							
	16	20	24	28	32	36	44	52
Adducted back of object.....	6	..	1					
Adducted front of object.....	1							
Adducted vs. adjacent surface of object....	23	32	21	18	6	4	1	1
Partly adducted; partly opposed.....	1	..	7	5	4	3	..	2
Opposed.....	..	..	..	11	16	22	33	29
Fingers which hold object								
2, 3.....	2	4	4	11	12	8	25	17
2, 3, 4.....	5	3	9	5	3	12	7	11
2, 3, 4, 5.....	7	8	6	8	6	4	1	2
2.....	..	..	..	..	1	2	..	1
3, 4.....	2	6	4	3	2	2	1	1
3, 4, 5.....	10	7	6	6	2	1		
4, 5.....	4	4	..	1				
4.....	1							

Source: GESELL, A., and HALVERSON, H. M. The development of thumb opposition in the human infant. *J. genet. Psychol.*, 1936, 48, 347.

Eye-hand Coordination.—Reaching and grasping, except in cases where the hand accidentally touches the stimulus, require eye-hand coordination, or the working together of the eyes and hands so that the former directs the movements of the latter. This is not present in the random reaching and grasping that appear shortly after birth, nor does it appear until thumb opposition is established. By the eighth month, eye-hand coordination is perfected to the point that random reaching and grasping no longer exist.

Eye-hand coordination has been studied by Watson and Watson (1921) by suspending a stick of candy within easy reaching distance of a

baby. Before the 122d day, the grasping was slow, clumsy, and without thumb opposition. By the 171st day, a well-coordinated movement, with right-hand preference, was established. When the baby is six to seven months old, he has well enough established eye-hand coordination to enable him to pick up little objects that he reaches for. In doing so, his gaze is directed toward the object, his mouth is generally open, both hands are held toward the object, with one in the lead, and the body is bent slightly forward.

The ability to reach for an object and carry it to the mouth develops early, at approximately the age of the opposed thumb development. Jones (1926) found that the youngest of the babies tested by her to reach for an object and carry it to its mouth was 116 days old. By the 269th day, all the babies tested had developed this ability. Both Kuhlmann (1922) and Gesell (1928) place it as a test for the six-month-old level.

Reaching and Grasping.—Purposive reaching and grasping appear early during the first year of life. At first, the baby waves with one or both arms when an object is held before him, but he cannot reach it except by chance. By the fourth month, he can reach purposefully for an object and can grasp it with few random movements. This is more difficult when the object is dangling before the baby, as in the case of a ring held on a string, than when the object is stationary, as a pellet on the table. It is likewise more difficult when the baby is in a sitting position than when lying on his back. The ability to reach for objects out of reach and grasp them independent of direct stimulation of the palm of the hand appears around the fifth month. The grasp is only partial, however, until the seventh month.

An analysis of the baby's method of reaching and grasping a cube placed in front of it has been made by Halverson (1931) and Gesell and Halverson (1936) with the aid of moving pictures. In reaching for the cube, the baby's first approach met with success at the age of twenty-four weeks. Speed in reaching was found to increase up to the age of thirty-two weeks and then decrease.

The approach to the cube took three different forms, the *backhand sweep*, the *circuitous sweep*, and the *direct approach*. From sixteen to twenty-eight weeks, either the backhand or circuitous approach was used; from thirty-two to thirty-six weeks, a less circuitous form of approach predominated; and by the ages of forty to fifty-two weeks, the direct approach was the usual one. Up to the age of twenty-eight weeks, the hands are lifted high in reaching for the cube, but from then until the fifty-second week, the height of the approach gradually decreased. In Fig. 25 are illustrations of the child's hand in grasping different objects.

Ten types of grasps appeared in the genetic series: (1) no contact, (2) contact, (3) the primitive squeeze, (4) the squeeze grasp, (5) the hand grasp, (6) the palm grasp, (7) the superior-palm grasp, (8) the inferior-

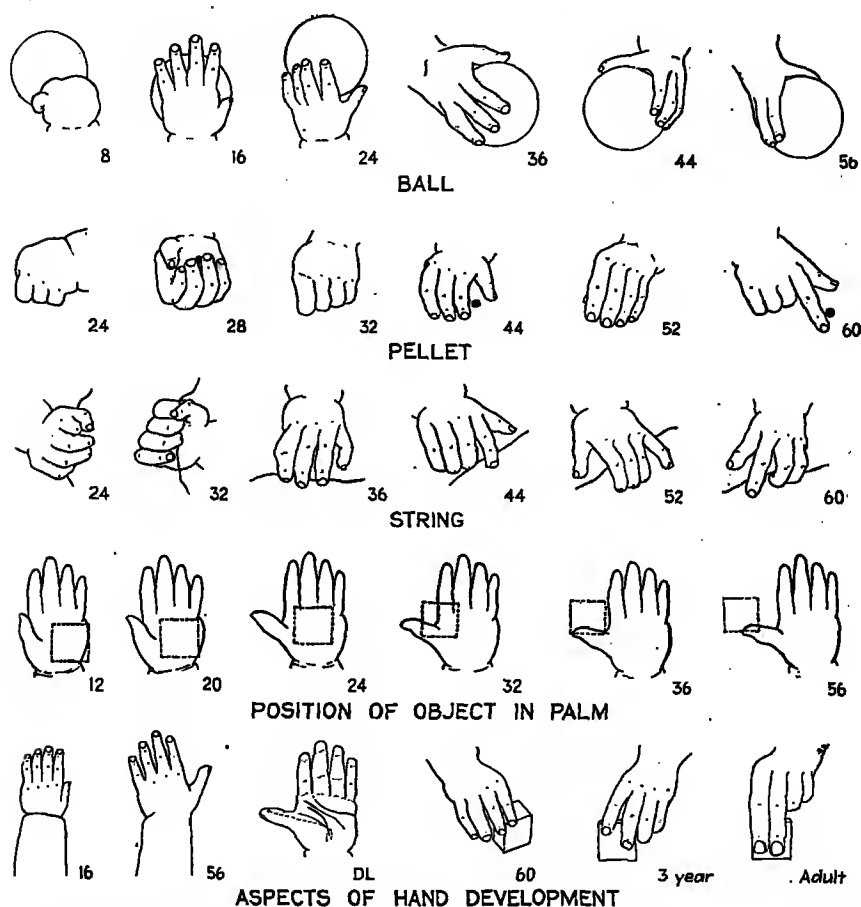


FIG. 25.—Illustrating a series of grasps in developmental sequence for each of three objects: ball, pellet, and string. (From H. M. Halverson, *A further study of grasping*. *J. gen. Psychol.*, 1932, 7.)

This figure also shows the six successive positions on the palm against which the fingers press objects, such as cubes. Under the caption, *Aspects of Hand Development*, appear in order: the forearm of a 16-week infant, the forearm of a 56-week infant, the developmental line (note broken line) of opposition in grasping, and digital grasping by a 60-week infant, by a 3-year-old child, and by an adult, respectively.

forefinger grasp, (9) the forefinger grasp, and (10) the superior-forefinger grasp. The two hands were used in grasping until the baby was twenty-eight weeks old, while after that the grasp was with one hand, the other hand resting on the table or following behind the one used but remaining

suspended in the air. By the age of sixty weeks, grasping closely approximated in form that of an adult.

The ability of babies to grasp and hold one, two, or three objects was studied by Lippman (1927). The objects offered were a tongue blade, bell, rattle, scissors, block, metal tube, piece of white paper, and steel tape measure. The following results were obtained:

TABLE XI.—ABILITY TO GRASP AND HOLD ONE, TWO, AND THREE OBJECTS

Percentage of the Babies	Age, Months
Acceptance of First Object	
8.3	4
58.8	4½
85.0	5
91.6	6
Acceptance of Second Object	
35.3	4½
74.9	6
77.3	8
85.0	9
Acceptance of Third Object	
33.3	6
40.9	8
80.0	11½
90.0	12-13

Source: LIPPMAN, H. S. Certain behavior responses in early infancy. *J. genet. Psychol.*, 1927, 34, 439.

From these results, Lippman concluded that the average baby of five months of age should be able to accept one object when handed to him, while the average baby of seven months should be able to accept two objects, and the average age for the acceptance of three objects is ten months.

Eating.—Hand control in eating has been carefully investigated. By the age of eight months, the baby can hold his bottle after it has been placed in his mouth, and one month later, he can put it in or take it out at will. At the end of the first year, he can drink from a cup and eat from a spoon, though he cannot handle them successfully for himself. During the second year, the little child begins to feed himself, with some spilling at first. In the beginning, he uses only his spoon and drinks from a cup, holding on with both hands. Gradually, with practice, his skill improves and he then lets go with one hand, holding his cup with the other hand alone.

By the end of the second year, the child learns to use his fork in addition to his spoon, but he is still unable to cut his food or prepare it for eating. During the third year, the child can spread butter or jam on his bread, and a year later, he will try to pull his meat apart with his knife.

Real cutting, however, is too complicated a skill to be learned much before the fifth year. Throughout the entire period of mastering skills in self-feeding, the child's attention must be concentrated on the task at hand if successful results are to be obtained.

Gesell (1940) has observed a definite sequence in the development of the child's ability to feed himself with a cup and spoon, with the ages at which each type of skill normally appears as follows:

TABLE XII.—DEVELOPMENTAL SEQUENCES IN EATING

Self-feeding (Cup)	
15 months	Holds cup with digital grasp. Apt to tip it too quickly with wrist rotation and thus spill most of contents. Close supervision is necessary.
18 months	Lifts cup to mouth and drinks well. Hands empty cup to mother; if she is not there to take it, is apt to drop it.
21 months	Handles cup well: lifting, drinking, and replacing.
24 months	Holds small glass in one hand as drinks.
36 months	Pours well from a pitcher.
Self-feeding (Spoon)	
15 months	Grasps spoon and inserts into dish. Poor filling of spoon. If brings spoon to mouth, is apt to turn it upside down before it enters mouth.
18 months	Fills spoon. Difficulty in inserting spoon in mouth; apt to turn it in mouth. Considerable spilling.
24 months	Inserts spoon in mouth without turning Moderate spilling.
36 months	Girls may have supinate grasp of spoon. Little spilling.

Source: GEsELL, A. *The first five years of life*. New York: Harper, 1940, p. 242. Quoted by permission.

Dressing.—Control of the hands to enable the child to dress himself comes later than the ability to remove his clothing. It is easier, for example, for a little child to pull off his socks and shoes than it is to put them on, and the motor skill involved in the former is much less than in the latter. The period of most rapid improvement in dressing is between $1\frac{1}{2}$ and $3\frac{1}{2}$ years (Key, *et al.*, 1936). Different garments present different degrees of difficulty. Stockings are easier to put on than shoes, and the putting on of a garment is easier than adjusting and fastening it. Girls as a rule dress themselves earlier and more efficiently than boys, owing partly to more flexible rotation at the wrist, partly to better general motor coordination, and partly to the greater simplicity of their clothing.

Wagoner and Armstrong (1928), using specially constructed jackets buttoning in front, at the back, and on the side, with buttons of different

sizes, loops, and buttonholes as fasteners, found that unbuttoning was easier than buttoning and could be carried out at an earlier age. From the age of two years, the child enjoyed trying to button and unbutton the jacket. From three to five years, he was able to button the buttons, if the fasteners were in front or on the side of the jacket. Loops proved to be easier to manipulate than buttonholes. The time involved in buttoning decreased from the second to the fifth year, and girls were found to be more proficient in this skill than boys.

In dressing, eye-hand coordination is necessary until the child learns to dress himself so automatically that he can do so by "feel" alone. While learning to dress himself, the child must see the button, hook, or fastener before he can manipulate it. If he cannot see the fastener, as is the case when it is located at the neck, shoulders, or back of the costume, he cannot fasten it. By three or four years of age, most children can deal with fasteners in the difficult positions just referred to if they look in the mirror. Only after the skilled movements involved in dressing are well developed, around the sixth year, can the child's hands manipulate fasteners without the aid of the eyes to guide the hands.

Handedness.—Genetic studies of babies have shown that during the early months of life, the baby is ambidextrous and shows no hand preference at all. By the middle of the first year, however, most babies have demonstrated clearly an unequal use of the two hands, both in preferential use and in greater strength. Several months later, by the ninth month, hand preference is definitely marked. The baby no longer needs to use both hands in grasping or handling objects but is able to get along satisfactorily with one hand.

Explanations of Handedness.—Whether the baby is naturally right or left handed, or whether the predominant use of one hand is the result of training and social conditioning, has been a question of dispute for generations. The most common belief is that handedness is a native trait, and any attempt to interfere with it will lead to serious nervous disorders, apparent most often in speech defects. Bryngelson and Clark (1933) maintain from their studies that left-handedness is a sex-linked characteristic transmitted usually from the male through the female and then back to the male.

Several explanations have been given for preferential use of the right hand. One is that the left side of the cerebrum is functionally superior to the right and thus determines right-hand preference. Another is that the right hand is structurally superior to the left, owing to the position of the fetus in the uterus. Still another is that handedness is a product of "sideness," or lateral dominance, with one side functioning spontaneously in preference to the other in involuntary acts, such as focusing one eye. This point of view was stressed by Giesecke (1936) from the records made

of the spontaneous use of the hands of babies from two weeks to eight months of age.

Watson (1921) has explained handedness as due to social conditioning. To test handedness in babies, he attached linen thread to the baby's hands and to levers that produced tracings on a smoked drum with every movement made by the hands. From data obtained by the use of this technique, he concluded that handedness is not an "instinct" but a "socially conditioned" form of behavior. However, further search is needed before the cause or causes of handedness can be definitely determined.

Norms for Hand Skills.—Tests of intelligence and motor development have shown what hand skills one can expect to find in a normal child at different ages. At twelve months, the baby can hold a pencil or crayon and can remove a paper cap from his head. At the age of two years, he can open boxes, unscrew lids from bottles or jars, turn the leaves of a book, build a tower of four or five blocks, put pegs in holes, insert a circle, square, or triangle in a form board, scribble with crayon or pencil, string beads, and cut a gash in paper with scissors.

TABLE XIII.—NORMS FOR ARM AND HAND SKILLS

Activity	Motor Age, Months
Ball throwing (9½-inch ball)	
4 to 5 feet.....	30
8 to 9 feet.....	44
12 to 13 feet.....	57
Ball throwing (16¼-inch ball)	
4 to 5 feet.....	30
8 to 9 feet.....	53
12 to 13 feet.....	Above 72
Catching ball (9½-inch ball)	
Arms straight, success in two or three trials.....	37
Elbows at side of body, failure or success in one trial.....	55
Catching ball (16¼-inch ball)	
Arms straight, success in two or three trials.....	34
Elbows at side of body, failure or success in one trial.....	51

Source: Adapted from WELLMAN, B. Motor achievement of preschool children. *Childhood Educ.*, 1937, 13, 311-316.

By the third year, the child can take care of many of his bodily needs, such as undressing himself, feeding himself, going to the toilet, and washing himself, can dry dishes, dust, carry a tray, string four beads in 2 minutes, build a bridge of three blocks in imitation of a given model, and copy a circle in imitation of a model. At the age of five years, the child should be able to fold a triangle from a paper 6 inches square in imitation of a model, copy a square when given a model to imitate, and tie a single knot around a pencil with a shoelace after looking at a model of a knot. From that age, skilled movements with the hands may

be acquired quickly and easily if the child is given an opportunity to learn and guidance as to the most efficient methods to use.

Norms for arm and hand skills in ball throwing and catching have been given by Wellman (1937) in Table XIII.

3. MOTOR DEVELOPMENT IN THE TRUNK

Turning.—The ability to turn the body from side to side, or from back to stomach, is not present at birth. By the second month, the baby should be able to turn from side to back; by the fourth month, from back to side; and, by the age of six months, to make a complete turn from stomach to stomach. This complete turn is not necessarily made at one time at first but rather, several partial turns, with rest periods between each, finally result in a complete turn of the body.

Rolling of the trunk comes from flexing the hips and stretching out the legs at right angles to the trunk. Schaltenbrand (1928) has described the method of rolling used by babies when they roll from their sides or backs onto their stomachs. In turning, the body moves first in the head region and last in the legs. The baby turns his head, then his shoulders, then his pelvis, and finally, with a pushing, kicking movement of his legs, manages to turn his entire body.

Sitting Alone.—The ability to sit alone, without any support, depends upon the development of the heavy muscles of the back. Before he can sit alone, the baby must have his whole trunk under control. Between the ninth and tenth months, the average baby should be able to sit alone, without support, for ten or more minutes. When he becomes tired, he slumps against some support or goes into a reclining position on his back or stomach.

Method of Sitting.—When the baby first sits alone, he often leans forward to keep his balance. His arms are generally outstretched at the side of his body, to help him to maintain his balance, and his legs are bowed, with the soles of his feet turned toward each other, to give him a wider base for balance. When seated in this way, the baby cannot raise himself to a standing position. If he tries to move, he generally topples over. After acquiring the ability to sit alone, many babies rock back and forth as a playful stunt. In Fig. 26 are given the characteristic positions of the baby's body in the development of a sitting posture.

Schaltenbrand (1928) has studied the method by which the baby comes to a sitting position. At first, the baby goes from a dorsal to a sitting position by turning his whole body to a ventral position, then squats on all fours, and finally pushes himself into a sitting position. By the second and third years, however, he found that the baby ceases to turn the whole body axis but leaves the pelvis in contact with the floor on one side, supporting himself with his arm on that side. By the

fourth or fifth year, the adult method of sitting develops, in which the body is rolled up symmetrically, with the aid of the arms on both sides.

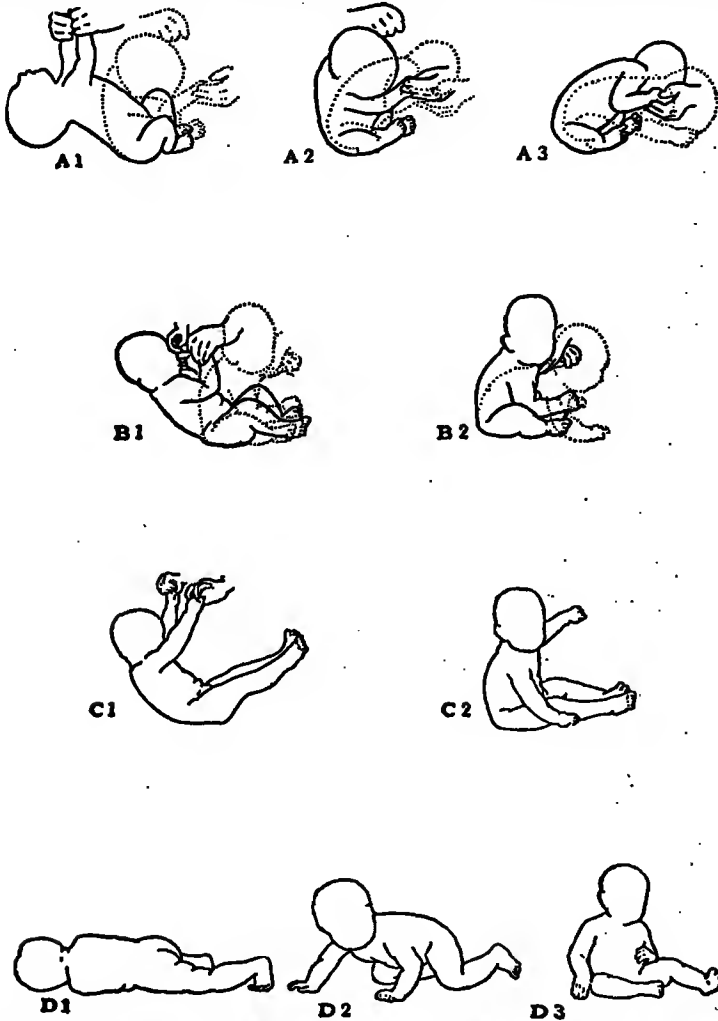


FIG. 26.—Development of a sitting posture. A1, 2, and 3 illustrate the passivity of the newborn when raised from a supine to a sitting position. B1 shows infant beginning to take active part in the rising position; B2, dotted line illustrates extension of upper extremities in order to prevent falling forward. C1 indicates a postural reversal from A1; C2 shows maintenance of erect sitting posture. D1 illustrates rolling prone preparatory to the independent assumption of a sitting posture; D3 shows the infant able to maintain erect sitting position without support on upper extremities. (From M. B. McGraw, *Growth: a study of Johnny and Jimmy*. Appleton-Century, 1935.)

Sitting Down.—Dropping from a standing to a sitting position requires nearly as much practice before it can be learned as is needed for

the baby to pull himself to a standing position. At first, when the baby sits down, he falls or topples over by giving way in the lower part of his trunk. Gradually, he learns by trial and error, combined with demonstration, how to bend his knees and slide down instead of keeping his knees stiff and falling over. This ability is achieved by the time the average baby is a year old.

4. MOTOR DEVELOPMENT IN THE LEGS

Most people believe that the baby learns to walk quickly. This, however, is not true. Walking really traces its origin to birth or even to early fetal life, when the infant makes kicking movements of an alternate type that closely resemble stepping. As a result of stretching and kicking, the baby learns to coordinate the muscles of his legs and trunk. Later, he develops balance and equilibrium. All of this is essential to walking and cannot be accomplished in a brief space of time.

Methods of Study.—In many of the baby biographies, references are made to walking and the preliminary stages leading up to it. Because of lack of control over environmental conditions, little value can be attached to these studies. The earliest scientific investigation of creeping and walking was made by Trettien (1900) in 1900. This investigation, based on data from medical journals, and hospital and questionnaire reports, covered 150 babies. More recently, detailed studies of locomotion, using moving-picture records of babies in different stages of development, have been made by Burnside (1927), Shirley (1931*a*), McGraw (1935), and Ames (1937).

In addition to camera studies, records of the babies' footprints have been taken to study the position of the feet in walking. Vierordt (1881) originated a technique for this type of study which involved the use of overshoes with tiny inkwells and pens on the heel and both sides of the ball of the foot. Burnside (1927) had the babies walk over strips of paper after walking over strips of inked muslin. Shirley (1931*a*) greased the soles of the baby's feet with olive oil. After the baby walked across strips of unglazed white paper, its footprints were brushed with powder of lampblack so that they stood out clearly. McGraw (1935) took moving-picture records of babies' feet from underneath glass on which the babies walked.

The Normal Course of Development.—Records obtained from carefully controlled experiments have given specific information about the normal course of locomotor development. Creeping movements, which are "wormlike" and "lizardlike" in character, can be observed in full-term babies during the first four months of life. When prone on his stomach, or lying on his back, the young baby kicks and squirms, often moving his body a few inches. By the end of the second week of life,

he can push against a hard surface, such as the end of the crib, with enough force to be able to move himself forward slightly. When held in an upright position, he at first prances and dances; later, as his muscles strengthen, he plants his feet firmly and makes definite stepping movements.

Rolling and Hitching.—The earliest forms of locomotion, to be found in all babies, is *rolling*. In this, the baby moves his body by means of a very crude sort of leg and arm movements. This is usually followed by *hitching*, or locomotion in a sitting position. The baby uses one leg to push himself along and the other is doubled under him or extended, thus helping to maintain his balance. In hitching, movement of the body is aided by the arms and hands, which accompany pushing or slight kicking

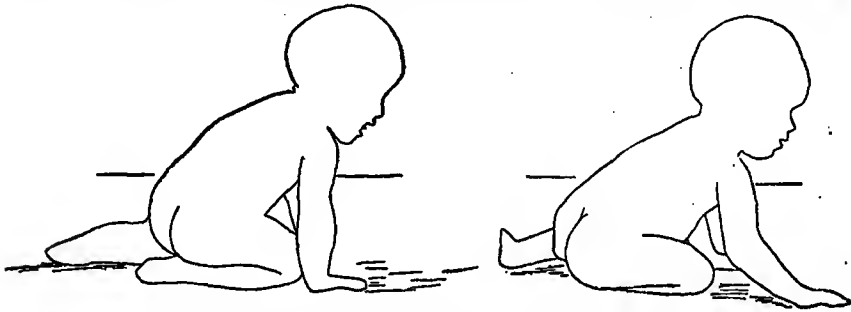


FIG. 27.—Hitching. (From L. H. Burnside, *Coordination in the locomotion of infants*. Genet. Psychol. Monogr., 1927, 2.)

movements of the legs. The movement in hitching is always backward rather than forward, which is characteristic of crawling, the next stage in the pattern of locomotion. Hitching is generally present by the sixth month. In Fig. 27 are given the characteristic positions of the baby's body in hitching.

Crawling and Creeping.—*Crawling* follows hitching in the normal sequence of development. It appears as early as the fourth month and reaches its peak between the seventh and ninth months. In crawling, the body is prone on the ground with the abdomen in contact with the ground. The head and shoulders are raised by supporting the weight in the upper part of the body on the elbows. The body is pulled along by the use of the arms, while the legs drag or make kicking movements. If only one leg is used to push the body forward, the other is used in an extended position to propel the body. Generally, the leg movements approximate swimming, in that the legs are drawn up to the body and then kicked out suddenly in a froglike manner.

By the age of nine months, the normal baby can *creep*. In this form of locomotion, the trunk is carried free from the floor but parallel to it, and movement comes from the use of the hands and knees. At first,

the movements are arhythmic and cross coordination is poor. With practice, rhythm appears and cross coordination is perfected to the point where only one limb moves at a time. As the baby acquires greater strength, he raises his knees from the floor, stiffens his legs, and walks "on all fours."

Ames (1937) studied crawling and creeping in 20 babies by means of moving pictures. Ninety-three per cent of the 14 developmental stages listed below were observed in all the babies. The stages he recorded are:

1. One knee and thigh forward beside body—28 weeks.
2. Knee and thigh forward, inner side of foot contacting the floor—28 weeks.
3. Pivoting—29 weeks.
4. Attaining inferior low creep position—30 weeks.
5. Attaining low creep position—32 weeks.
6. Crawling—34 weeks.
7. Attaining high creep position—35 weeks.
8. Retrogression—36 weeks.
9. Rocking—36 weeks.
10. Creep, crawling—36 weeks.
11. Creeping—40 weeks.
12. Creeping, near step with one foot—42 weeks.
13. Creeping, step with one foot—45 weeks.
14. Quadrupedal progression—49 weeks.

These are not fixed, definite stages through which every baby passes. On the contrary, marked individual differences exist. Different babies stress different stages. For example, some babies crawl mostly in a prone position, and others crawl while sitting or hitch. Some babies may even skip a stage or remain in it for a very short time and then pass on to the next stage. In Fig. 28 are illustrated the 14 stages recorded by Ames.

In the early stages of locomotion preceding walking, there is a marked overproduction of movement in the entire body. With practice, coordination results and spreads from the head to the leg region. While the action of the legs remains arhythmic, the arms are flexed and used in alternate fashion. Coordination is imperfect during the crawling stages, especially in the lower part of the body. By the time the baby is creeping, nearly perfect coordination appears, and a gradual increase in speed of movement is apparent.

Standing.—Standing is the next step in the developmental sequence leading up to walking. Normally, standing with support overlaps creeping and crawling and is a necessary preliminary to walking. (Refer to Table IX and Fig. 23 for a summary of stages leading up to standing.) Standing with the support of furniture was found by Shirley (1931a) to be an easier task than pulling one's self to a standing position. The median age for standing with support for one minute was found to be forty-two weeks. Gradually, the baby lessened the amount of pressure placed upon the

object supporting him and finally tried to stand completely without support. Pulling themselves to a standing position proved to be very difficult for babies because their legs had a tendency to slide under them. The median age for pulling to a standing position was forty-seven weeks, while standing alone did not appear in the median baby until sixty-two weeks. The first steps are taken when holding on to someone, or to some object, like a piece of furniture, for support.

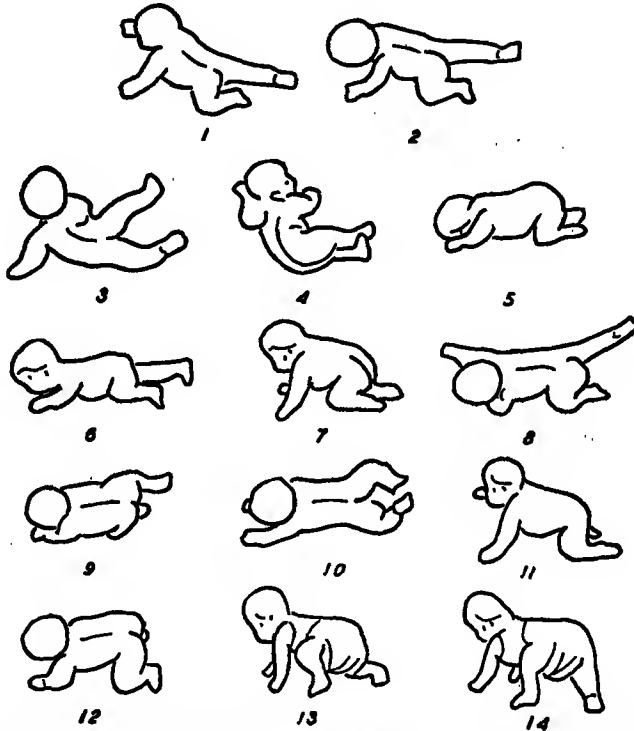


FIG. 28.—Summary view of stages one to fourteen. (From L. B. Ames, *The sequential patterning of prone progression in the human infant*. *Genet. Psychol. Monogr.*, 1937, 19.)

To maintain his balance, the baby stands at first with his feet far apart, the toes turned out, the knees locked, and the head, as well as the upper part of the trunk, carried forward. This is true, whether the baby stands alone or whether he supports himself by holding on to some object or person. When he falls, he generally falls backward.

Walking.—After the baby has gained enough confidence in his ability to stand with support, he cautiously takes a step. Gradually, with practice, his skill increases, and he actually walks while holding on to something for support. This early *walking with support* comes when the baby is acquiring the ability to stand alone.

To predict the age of first *walking alone*, it is a fairly safe rule to apply to double the age of sitting alone. Or, if the baby creeps, the age of walking will be approximately $1\frac{1}{2}$ times the age of creeping. If the baby is precocious in sitting alone, it is safe to predict that he will be precocious in walking. If, on the other hand, he is slow in sitting alone or creeping, he will, other things being equal, be slow in walking alone.

Experimental studies of large groups of babies have shown that the average age at which the baby can stand alone and walk with support is one year. By fourteen months, two-thirds of the babies of that age walk without support, and by the age of eighteen months, the average baby walks like an adult.

Shirley (1931a) found that four distinct stages of progress led up to walking. These were: (1) Early period of stepping. Babies whose walking records started before twenty weeks were found to dance, pat their feet, and make three or four swinging, lunging steps while being supported. This lasted for approximately 11 weeks. (2) Period of standing with support. In this period, the baby rests most of his weight on his feet and tenses the muscles of his outstretched arms to help to maintain his balance. The median length of this period was found to be 14 weeks, lasting from twenty-eight to forty-two weeks. (3) Period of walking when led. In this period, the babies walked when led by both hands. Rapid progress in speed of walking, increased uniformity in length of step, increased width of step, and great variability in size of the stepping angle characterized this stage, which appeared at a median age of forty-two weeks and extended for a median period of length of 22 weeks. (4) Period of walking alone. Rapid increase in speed of walking and length of step, and decrease in width and angle of step characterized this period, which began at ages ranging from fifty to seventy-six weeks. Marked progress appeared up to the ninetieth week.

Not all babies go through all of these stages, as described by Shirley, in learning to walk. Environmental control, height and weight, and many other factors determine which of these stages will appear and the age at which they occur. The order of appearance and the degree of overlapping of the different periods varies with different cases. What is characteristic of all forms of locomotion, in all babies, is that the head is held erect to enable the baby to see where he is going. In walking, the body is erect and motion comes from the use of the legs alone. At first, balance is poor. As an aid to maintaining equilibrium, the baby's arms are held outright, much like those of a tight rope walker, or are pulled up to the body. The feet are turned outward, and the legs are stiff. A rhythmic alternation of the two legs occurs. The head is held slightly forward, and the baby looks straight ahead of him, instead of at the floor. This is necessary if balance is to be maintained, though it

usually results in many falls. Falls are caused also by poor general coordination and the fact that the baby raises his feet far from the floor and consequently loses his balance. Figure 29 illustrates the characteristic body posture of the baby in the early stages of walking.

Foot Positions in Walking.—In early walking with support, Shirley (1931a) found the length of the step to be short and very erratic. The median length of the step increased with age up to eighteen months, when it ceased increasing and became very regular. Noticeable changes were also apparent in the width of step. In the stepping stage, 5 centimeters between the toes of the two feet, with the heels not touching the floor, was the width of the step. When the stage of walking with aid was reached, a sudden increase in the width of step appeared and continued throughout the entire period. In walking alone, the width of the step increased steadily until the end of the second year.

In measuring stepping angles, Shirley found that there were great fluctuations during the standing periods and walking with- and without-aid period. With increase in perfection of walking, the walking angles decreased and finally reached zero degrees, when the feet were parallel. Out-toeing is characteristic of the early stages of stepping and walking with or without help.

Analysis of cinema records of baby footprints by McGraw and Weinbach (1936) led them to believe that the type of stepping movement made is a more important index of progress than the number of steps taken. At first, the baby places one foot before he starts to move the other. Later, as his skill in walking improves, he will start to raise the second foot before he has completely placed the first. At six months, the baby contacts the floor only with his toes and the ball of his foot. When he begins to walk, on the other hand, the whole sole of his foot is placed in contact with the floor. With improvement in walking, the contact is heel to toe, as shown in the accompanying pictures (Fig. 30).

Improved Coordination in Walking.—When the baby first walks, there is an excess of movement, not in his legs alone, but in his whole body. Gradually this decreases. Coordination of the arms comes before that

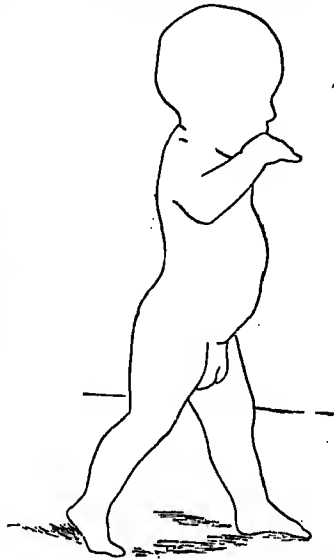


FIG. 29.—Walking. (From L. H. Burnside, *Coordination in the locomotion of infants*. *Genet. Psychol. Monogr.*, 1927, 2.)

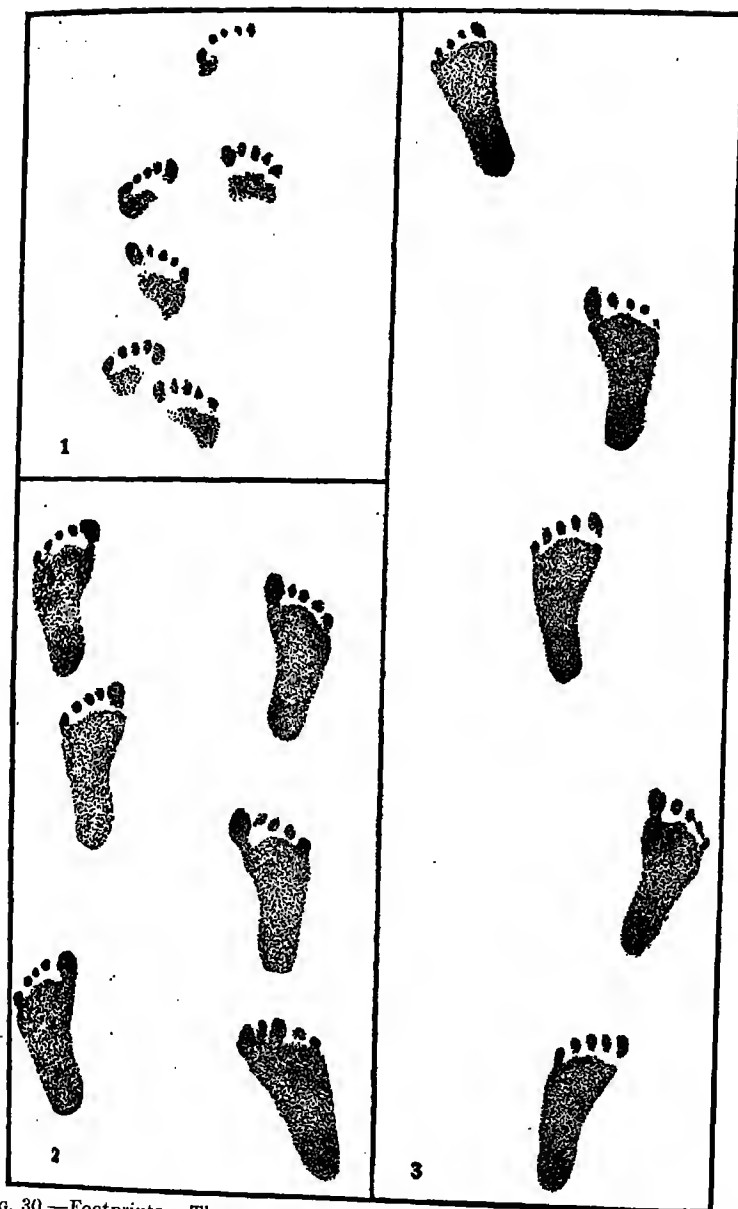


FIG. 30.—Footprints. These prints illustrate developmental phases in the contact of the feet with the surface during erect locomotion. 1, Digital progression, narrow base. 2, Plantigrade progression, wide base. 3, Heel-toe progression, normal base. (From M. B. McGraw, *Growth: a study of Johnny and Jimmy*. Appleton-Century, 1935.)

of the legs, and this helps to maintain a better body balance. With practice, the length of the step increases; the width and variability of the step decreases; the motion of the legs is more rapid and harmonious, resulting in a gradual increase in speed of walking; and the steps become straight rather than with toes pointing outward, which is characteristic of early walking. Likewise, the tendency to trot or walk on the toes gives way to a flatter type of stepping movement.

Marked individual variations appear in the style of walking of different children. It requires several years before a characteristic gait is established. Anything, such as too tight or too stiff shoes, an overweight condition of the body, or fear of taking a long, striding step because of repeated falls in the past, will have a marked influence on the permanent style of the individual's gait.

Skills Following Walking.—From the age of eighteen months to the beginning of the school age, between the fifth and sixth years, the motor development in the legs consists primarily of the perfection of walking and the acquisition of related skills. *Running, hopping, skipping, jumping, and climbing* soon follow walking.

1. *Running.*—Running at first is little more than fast walking with crude, uneven steps and a general clumsiness of the entire body that leads to many falls. By the age of five or six years, the young child can not only run with relatively few falls, but he can play games at the same time. When the young child first starts to run, he does so not because he wants to get to a given place quickly but because he derives satisfaction from the activity itself. Later, as the ability to run is well developed, he reserves this activity for occasions requiring speed.

2. *Jumping.*—Jumping is at first an exaggerated stepping with one foot and then the other. Or the child may drop himself from the place of support lifting both feet simultaneously and stepping with both feet at once. The body is not propelled forward, and, as a result, the child generally lands in a sprawl and has trouble in getting up. This is the characteristic method of jumping of the two-year-old. By the age of four, the child can jump well. He now propels his body upward and forward, bends his knees, swings from a higher to lower level, and lands in a standing position. *Skipping* and *hopping*, which are modifications of the jump movement, are likewise well developed by the kindergarten age.

3. *Climbing.*—Climbing steps is accomplished by crawling and creeping. This occurs before the baby can walk alone. In going down steps, the baby generally goes backward. After he can walk alone, the baby goes up and down stairs in an upright position, holding on to the railing or the hand of a person. At first, one foot is placed on the step and the other drawn up to it. The same foot is used each time to make the

advance. A similar method is used for going down stairs. Gradually, with practice, the child lets go of the railing and uses his legs alternately, as if walking. This adult manner of step climbing is attained by four years of age, provided the child has had ample opportunity to learn.

Norms.—Studies of groups of babies and young children have shown when, in the average child, one can expect certain motor skills following walking. Bayley (1935) has devised a series of motor development tests, the "California infant scale of *motor development*," made up of tests from several scales. In the table below are listed a number of motor performances, following walking, with the age placement for each.

TABLE XIV.—LOCOMOTOR SKILLS FOLLOWING WALKING

Motor Performances	Age Placement, Months
Walks sideways.....	16.5
Walks backward.....	16.9
Stands on right foot with help.....	19.9
Stands on left foot with help.....	19.9
Walks upstairs with help.....	20.3
Walks downstairs with help.....	20.5
Walks upstairs alone; marks time.....	24.3
Walks downstairs alone; marks time.....	24.5
Stands on left foot alone.....	29.2
Stands on right foot alone.....	29.3
Walks on tiptoe.....	30.1
Walks on line; general direction.....	31.3
Walks upstairs, alternating forward foot.....	35.5
Jumps from height of 30 centimeters.....	37.1
Distance jump 10 to 35 centimeters.....	37.3
Distance jump 60 to 85 centimeters.....	48.4
Walks downstairs—alternating forward foot.....	50.0

Source: BAYLEY, N. The development of motor abilities during the first three years. *Monogr. Soc. Res. Child Developm.*, 1935, 1. Condensed from table on p. 3.

LATER IMPROVEMENTS

By the end of the second year, the child's sensorimotor equipment is complete in its general form. After that, development consists primarily of increase in strength and facility of performance. No distinctly different types of muscular activities appear after early childhood. New forms of skilled performance represent utilization of already present skills, in new forms. There is a perfecting of old skills, resulting in better coordination, fewer errors, smoother movements, and more graceful, rhythmic activities. From the fifth or sixth year, increased speed, accuracy, and steadiness in the use of the muscles enable the child to be more independent of others. Up to the beginning of adolescence, because children enjoy all types of play which involve skills, such as skating, bicycling,

swimming, and ball games, there is rapid improvement in all forms of complex activities.

Individual Differences.—The repertoire of skills acquired after the basic motor coordinations have been attained varies from one child to another. What skills the child will acquire depends to a large extent upon his environment and his opportunity to learn. Children in the rural districts, for example, acquire more skills in climbing than do children in urban communities where opportunities for climbing are distinctly limited. Because of the wide variety of skills that different children acquire, and because of the practical difficulty of observing older children who, for the most part, resent adult supervision in their play, the skills of older children have not been studied as extensively as the basic ones. Most of the observations have been limited to activities involving the hand and arm, though what holds true for those parts of the body is merely a general indication of motor coordination throughout the entire body.

Speed.—Studies of *speed* by Johnson (1928), Goodenough and Tinker (1930), Gates and Scott (1931), Stutsman (1926), Moore (1937), and others in situations involving tapping, putting marbles through a round slot in a box, buttoning two pieces of cloth, or putting pegs in holes in a board, have shown that speed increases at a fairly uniform rate throughout childhood. Increase in speed thus proved to be a function of age. This increase continues until the sixteenth or eighteenth year, but at a slower rate after the thirteenth or fourteenth year. At all ages, boys were found to exceed girls.

Accuracy and Steadiness.—Studies of *accuracy* in tracing and aiming experiments by Johnson (1928), Wellman (1926a), and Rice (1931) in situations involving muscle control in drawing straight lines, drawing a diamond from a model, or aiming at a target, have shown a gain in accuracy up to the ages of thirteen to fourteen years. After that time, the improvement observed is small. *Steadiness*, as measured by how little involuntary movement occurs when the finger, hand, arm, or whole body is held as nearly motionless as possible, improves with age. The rate of increase, however, and the cessation of development is unknown, as no retest studies, after a period of time, have been made.

ADOLESCENT AWKWARDNESS

Through childhood, physical growth progresses at a more or less uniform rate, and the child gradually acquires control over his body. This enables him to develop good coordination. At puberty, however, there is a spurt in physical growth accompanied by an unevenness of growth which throws the muscular system out of coordination. This, in turn, leads in many cases to awkwardness and clumsiness that are invariably

accompanied by shyness and self-consciousness. Adolescent awkwardness, with its accompanying shyness, is more pronounced in boys than in girls.

Increase in bodily strength arising from muscle growth often results in a too compelling action in one direction or another, making the action appear to be uncoordinated. The adolescent bumps into things, drops things, thus seeming to be "all thumbs," or even trips over his own feet. If he is being watched, this awkwardness is increased, and the more embarrassed he becomes, the more pronounced is his clumsiness. To avoid embarrassment, the adolescent then withdraws from social situations whenever possible.

In games and sports, or any nonsocial situation, the adolescent may show unexpected skill. This is because he forgets about himself, and self-consciousness is not present to interfere with his activities. His interest in these activities leads him to try to attain perfect control, and he derives great satisfaction from success in any game or sport demanding highly skilled action and muscle control.

In social situations, the adolescent usually moves about awkwardly, stands on one foot and then on another, or assumes an uncomfortable posture. It is not until he reaches late adolescence, around the sixteenth or seventeenth year, that he has enough muscle control to avoid this clumsiness and develops a sense of poise in the presence of others.

DELAYED MOTOR DEVELOPMENT

Not all children progress through the stages of motor development recorded above at the average or normal ages. There are many instances of accelerated development and even more of retarded development. In most cases, where motor development is retarded to an appreciable extent, the delay becomes apparent early. Should remedial treatment be given as soon as the delay is recognized, it could, in most instances, be eliminated or certainly minimized to a marked extent.

Seriousness of Delayed Motor Development.—Delayed motor development is serious, not only because it keeps the child from reaching the stage of independent action when he normally should, but primarily because it interferes with the social development of the child. The little child who is slow in developing control over his body finds himself unable, as he reaches the second or third year, to keep up with other children of that age. His movements are clumsy, awkward, and uncoordinated, with the result that he cannot join in the play activities of the group. If he is backward in feeding himself, dressing himself, or taking care of his own needs, he feels self-conscious and shy when in the presence of other children whose independent action enables them to take care of themselves without the aid of parent, nurse, or teacher. As a result of this

early backwardness in the development of motor control, many young children develop feelings of inferiority which cause them to withdraw from the social group, and this lays the foundation for unsocial attitudes and behavior.

Causes of Delayed Motor Development.—A few of the most common causes of delayed motor development are:

1. *Illness.*—Popular opinion holds that the relationship between the physical condition of the child and his motor development is a close one. This would mean that, at a given age, the children who are in the best physical condition would be more precocious in their motor development than children of the same age who are in poor physical condition owing to illness, malnutrition, or other causes.

How illness of a severe nature, such as pneumonia, rickets, and diphtheria, or any major operation occurring during the first two years of life affects the motor development of children has been studied by Smith (1931). His data, based on parents' testimony concerning the age at which their children developed certain motor traits, is presented below.

TABLE XV.—HOW ILLNESS INFLUENCES MOTOR DEVELOPMENT

Trait	Mean age, months	Number
Head up:		
Control.....	2.400	513
Sick.....	2.460	81
Sitting up:		
Control.....	5.341	619
Sick.....	5.778	81
Creeping:		
Control.....	8.440	583
Sick.....	9.372	81
Walking:		
Control.....	12.772	831
Sick.....	14.403	81

Source: SMITH, S. Influence of illness during the first two years on infant development. *J. genet. Psychol.*, 1931, 33. Condensed from table on p. 285.

His conclusion, based on the above presented data, was that "severe illness preceding the development of any trait reduces the apparent rate of development of that trait to about 88 per cent of what it would otherwise have been."

A study of the effects of rickets has been made by Gessell (1928) in the case of rachitic and nonrachitic babies at twelve, eighteen, and

twenty-four months of age. In the accompanying table are given the percentages of babies of the rachitic (*R*) and nonrachitic (*N*) groups who had attained the necessary motor development to walk at a given age. These data suggest that rickets, during babyhood, may be regarded as a cause of delayed motor development.

TABLE XVI.—INFLUENCE OF RICKETS ON MOTOR DEVELOPMENT

	12 months		18 months		24 months	
	N, %	R, %	N, %	R, %	N, %	R, %
Walks with help of chair.....	66.67	41.67	98.67	93.33	100	90.91
Walks alone, fair balance.....	14.81	8.33	96.00	83.33	98.00	81.82
Walks around house; seldom falls.	7.41	0.00	57.33	20.00	96.00	50.00

Source: GESELL, A. *Infancy and human growth*. New York: Macmillan, 1928. Condensed from table on p. 270. Quoted by permission.

2. *Nutrition*.—It is generally assumed by doctors that undernourished babies are slow in developing muscle coordination owing primarily to muscular weakness and the slow rate of hardening of the muscles. Few experimental studies, however, have been made to determine how marked an influence this factor exerts. The effect of nutrition on the age of walking has been studied by Variot and Goteu (1927) and the results summarized in the following table:

TABLE XVII.—INFLUENCE OF FEEDING ON AGE OF WALKING

Nutrition	Age of walking alone, months	Per cent of 500 cases
Breast feeding only.....	11 to 14	82.0
Breast and bottle mixed.....	11 to 14	68.58
Bottle only.....	11 to 14	61.45

Source: VARIOT, G., AND GOTCU, P. Le début de la marche bipède chez le jeune enfant dans ses rapports avec l'âge et la taille. *Bull. et Mém. de la Soc. d'anthrop. de Paris*, 1927, 8, 17-23.

3. *Size of the Body*.—The size and body proportions of the baby exert a marked influence on his motor development, especially in the case of sitting, standing, and walking. The center of gravity of the baby's body must shift downward if the baby's balance is to be maintained. There must be an increase in the ratio of leg to trunk length and a decrease in the ratio of weight to height if proper balance is to be achieved. The size of the baby was found by Shirley (1931a) to have some influence on the age of first walking. Small-boned, thin, and muscular babies were found, in general, to walk sooner than short, rotund, or exceedingly heavy babies.

4. *Hampering Clothing.*—The present fashions in clothing for young children permit freedom of movement that was formerly not possible when little children were so completely enveloped in clothing that their every move was restricted. The less clothing the little child has, the easier it is for him to exercise his muscles and, as a result, the sooner he will gain control over them. This is especially true of shoes which, if stiff, hamper the use of the feet and thus delay walking. As the baby maintains his balance and walks first by digging his toes into the surface on which he walks, his feet must be restricted as little as possible by his shoes.

A study made by Smith *et al.* (1930) of two comparable groups of babies, one living in Hawaii and the other in Iowa, showed that the babies of the former group walked approximately six weeks earlier than those of the latter group. The suggestions made by Smith to explain this difference were that in the warmer climates, babies are exposed more to the growth-stimulating ultraviolet rays of the sun and are less hampered by clothing, thus giving them a better opportunity to acquire the ability to walk.

5. *Lack of Opportunity to Develop Muscle Control.*—In many instances, motor development is delayed because of lack of opportunity for practice. The little child whose environment is restricted to crib, coach, or play pen, or who, if given a wider environment, finds the floors so slippery that he falls and that everything he leans on for support slides under his weight, is hampered in developing muscle control. The environment of an adult is, in almost every respect, unsuited to the needs of a young baby and thus offers little opportunity for him to get the practice needed for the acquisition of motor control.

6. *Lack of Incentive to Develop Muscle Control.*—Even if the young child is given an environment suited to his needs, he may be slow in developing muscle control because of lack of incentive to do so. If he is pampered, waited on, and his every wish satisfied, it is not surprising if he becomes lazy. This, in turn, interferes with the development of muscle control because of the lack of effort put forth by the child to acquire it. In walking, dressing, and self-feeding, this is especially true.

Gesell and Lord (1927), in a study of nursery-school children of low and high economic status, found that in verbal, practical, and emotional abilities, the children from the more favored environments ranked above those from the poorer environments. In self-care, on the other hand, the children whose homes were in the tenement districts surpassed those from the better districts in such skills as washing the face and hands, combing the hair, and lacing and tying shoes. Their interpretation of this difference was that self-care depends largely upon motivation. The children from poorer homes had a greater environmental stimulus than did the children from better homes.

7. *Too Little Opportunity to Learn.*—What to an adult is a simple act is, to a child, a complex one. Buttoning a suit, tying a shoe, and even carrying food to the mouth with a spoon are complex enough to necessitate much practice on the child's part before the acts are mastered successfully. If the child is not given plenty of opportunity to master these skills, or if he is rushed while attempting to master them, thereby creating a state of nervous tension which militates against muscle control, he is apt to be retarded in acquiring the skills.

8. *Emphasis on Specific Movements.*—Teaching specific movements before the gross movements are perfected very often delays the acquisition of skilled movements. For example, in dancing or writing, the child is expected to coordinate the smaller muscle teams before coordinating the larger ones. Because this is too complicated a task for him, it will not only discourage him but also delay the acquisition of the desired skills. The young child should, for example, be given plenty of opportunity for scribbling freely and without restraint before he is expected to perform the more complicated movements involved in drawing or writing. Similarly, a chance to practice stringing beads or buttons should precede any attempt to teach the little girl to sew.

9. *Low-grade Intelligence.*—The relationship between intelligence and motor development, especially during the first years of life, is so marked that motor items figure largely in tests of general intelligence for children under two years of age. Babies, who are slow in sitting up, standing up, or walking, generally prove, as time goes on, to be backward in intellectual development. On the other hand, those who are precocious in motor development prove to be, for the most part, intellectually precocious.

How intelligence affects the age at which babies begin to walk has been studied by Mead (1913). Fifty "normal" children were compared with 144 "schoolable" defectives from the Indiana School for Feeble-minded Youth. The average normal child was found to begin to walk at the age of 13.88 months, while the feeble-minded children did not, on the average, achieve this skill until the age of 25.08. Terman (1925) found that gifted children walked about a month earlier than Mead's "normal" children. Abt, Adler, and Bartelme (1929) report a correlation of .37 for girls and .36 for boys between the age of walking and intelligence.

10. *Fear.*—Forcing a child to carry out a skilled movement before his muscles and nervous system are ready for it invariably results in delayed motor control. Fear which comes from falling often causes an inhibition that makes the child hesitant to repeat the act associated with failure. When the little child is forced to walk before he is ready to do so, to climb stairs when he is not sure of himself walking on a straight floor, or to dive before he can swim with ease and confidence, fear is the usual outcome,

and this militates against further attempts to develop the skill. The result is a delayed development of the activity.

NORMS OF MOTOR DEVELOPMENT

In order to give parents, physicians, and educators definite standards of the motor development of the baby at different ages to enable them to determine whether or not the baby is progressing normally, several "inventories" or "norms" have been prepared. Today, they are widely used. One of the best known is the Gesell (1928) "Normative summaries," based on the study of 50 normal babies at each level investigated. A sample of Gesell's developmental schedule is as follows:

GESELL'S NORMATIVE SUMMARIES FOR MOTOR DEVELOPMENT

One-month level.

1. Lifts head from time to time when held to the shoulder.
2. Makes crawling movements when laid prone on flat surface.
3. Lifts head intermittently, though unsteadily, when in this prone position.
4. Turns head laterally when in prone position.

Six-month level.

1. Sits momentarily without support, if placed in a favorable leaning position.
2. Grasps with simultaneous flexion of fingers.
3. Retains transient hold of two cubes, one in either hand.

Twelve-month level.

1. Walks with help.
2. Lowers self from standing to sitting position.
3. Holds crayon adaptively to make stroke.

Eighteen-month level.

1. Climbs stairs or chair.
2. Throws ball into box.
3. Scribbles spontaneously and vigorously.

Thirty-month level.

1. Goes up and down stairs alone.
2. Piles seven or eight blocks with coordination.
3. Tries to stand on one foot.
4. Copies vertical or horizontal line.

(Abbreviated from pp. 128-135)

Kuhlmann (1922) in his revision of the Binet-Simon test has given the following standards of motor development for tests of intelligence:

Age 3 months.

1. Carrying hand or object to mouth at will, not merely through random, chance movement.
2. Binocular coordination, when object is moved from right to left, and up and down in front of the baby's face (vertical and horizontal).
3. Turning eyes to object in marginal field of vision.
4. Voluntary wink at an object threatening the eyes.

Age 12 months.

1. Sitting without support for 2 to 3 minutes and standing unsupported for 5 seconds or more.

2. Imitation of such movements as shaking a rattle, nodding the head, shaking the head, or pursing the lips.
3. Marking with a pencil on a piece of paper.

Age 18 months.

1. Drinking from a glass.
2. Feeding with spoon or fork.

Age 2 years.

1. Initiation of simple movements as raising both arms or clapping hands.
2. Copying circle.

Bayley's (1935) scale of fundamental motor coordinations, with the age placement in months for each item includes the following activities:

TABLE XVIII.—FUNDAMENTAL MOTOR COORDINATIONS

Fundamental Motor Coordinations	Age Placement, Months
Lifts head at shoulder.....	0.5
Head erect—vertical.....	1.9
Head erect and steady.....	2.9
Turns from side to back.....	3.4
Prone—elevates self by arms.....	3.5
Sits with support.....	5
Holds head steady.....	3.5
Beginning of thumb opposition.....	4.1
Sits with slight support.....	4.6
Turns from back to side.....	5.0
Partial thumb opposition.....	5.1
Effort to sit.....	5.4
Head balanced.....	5.5
Simultaneous flexion and thumb opposition.....	5.7
Sits alone momentarily.....	5.7
Pulls to sitting position.....	6.2
Sits alone 30" or more.....	6.2
Rolls from back to stomach.....	7.0
Complete thumb opposition.....	7.6
Sits alone, steadily.....	7.5
Sits alone with good coordination.....	8.5
Raises self to sitting position.....	9.4
Early stepping movements.....	9.6
Pulls to standing position.....	10.5
Stands up.....	10.6
Walks with help.....	11.6
Sits down.....	12.5
Stands alone.....	12.5
Walks alone.....	13.0

Source: BAYLEY, N. The development of motor abilities during the first three years. *Monogr. Soc. Res. Child Develop.*, 1935, 1. Condensed from table on p. 3.

An interesting comparison might be made if the age placements, given above, were compared with the stages of motor development, as outlined by Shirley in Table IX, and with Fig. 23, in which McGraw has shown graphically the developmental phases in the assumption of an erect posture.

CHAPTER VII

DEVELOPMENT OF SPEECH

The study of the first sounds uttered by a baby, and their subsequent development into a vocabulary large enough to enable the child to be understood by others or to communicate with them, is one of the most interesting aspects of the child's development. Because it involves so many complicated activities, speech is a skill which develops at a slower rate than the motor skills described in the preceding chapter.

Speech vs. Language.—"Language" refers to *every* means of communication in which thought and feelings are symbolized so as to convey meaning, including such widely differing forms of communication as written, spoken, sign, facial, gesture, pantomime, and art. "Speech," on the other hand, is merely one form of language in which articulate sounds or words are used to convey thoughts. The capacity for speech is essentially human.

All sounds made by the human being may not justifiably be classed as "speech." Vocalization, in the form of cries or explosive sounds, does not become speech until meaning is associated with the sounds made. Every form of vocalization, which occurs up to the time that the young child associates meaning with the sounds he uses, belongs to the prespeech level of development. When true speech begins is an individual matter and varies from one child to another. It is often difficult to determine whether the child is really speaking or if the words he utters are merely "parrot talk," in that he does not know their significations but imitates blindly the sounds heard.

Criteria of Speech.—Two criteria should be applied to determine whether the young child has emerged from the use of prespeech forms of communication. These two criteria are: 1. The child must pronounce his words so that they are readily understandable to others rather than comprehensible only to those who, because of constant contact with him, have learned to understand him. 2. The child must know the meaning of the words he uses and must associate them with the objects they represent. "Da-da," for example, must be used only to refer to one person, or "ball," to refer only to balls and not to toys in general. "Baby talk" may satisfy the second criterion of real speech, since words are identified with objects, but it does not satisfy the first criterion of comprehensibility.

INCENTIVES TO SPEAK

The young child learns to speak according to his needs. If he can get what he wants without bothering to ask for it, he does not put forth the effort needed to learn so complicated and difficult a task as speaking. When substitutes for speech, such as crying or gestures, serve his purpose adequately, and when he discovers that he can get what he wants by using them, his incentive to learn to speak is weakened. This leads to delayed speech in babyhood and to a limited vocabulary in the childhood or adolescent years.

The child learns to use the words he needs. In the section of the chapter relating to the building up of a vocabulary, it will become apparent that the child not only learns first the words for which he has the greatest need but also that he uses substitutes, such as slang terms, when he wishes to express an idea but lacks adequate words to convey his meaning.

The prime "needs" of the young child which act as incentives to his learning to talk are: (1) the desire to secure information regarding his environment, and later about himself or his friends, the need for which is readily apparent by the age of $2\frac{1}{2}$ to three years; (2) to give commands or express wants, like "want to go 'bye-bye'" or "give baby ball"; (3) to bring the child into social relationships with others; and (4) to express his thoughts and ideas.

METHODS OF STUDYING SPEECH DEVELOPMENT

All baby biographies record in more or less detail the first words used by the babies studied. They likewise give information about the size of the vocabulary that the babies use from time to time, the parts of speech employed, and the correctness of pronunciation. Because baby biographies are, for the most part, records of children of high-grade intelligence, data thus obtained is of little value in determining norms of speech development for children as a whole.

Scientific Methods.—Recently, studies based on groups of children of different ages, of known intellectual levels, and from controlled environmental conditions, have been made. The data thus obtained have a degree of accuracy not found in the earlier studies. The scientific methods of investigation take three forms, *observational studies*, *tests*, and *experiments*. Observations are sometimes made on single children continuously over a period of time or at periodic intervals and sometimes on large numbers of children by their mothers or by psychologists in connection with psychological examinations. McCarthy (1930), for example, recorded for each child a sample of 50 consecutive responses under uniform conditions, when the child was alone in a room with an adult observer and provided with toys and picture books. At no time

was direct verbal stimulation used. Intelligence tests, in almost every case, include measures of the size and type of vocabulary present at a given age, as well as the degree of comprehension attained. Direct experiments on speech development are limited for the most part to children of older ages.

Speech development of children is difficult to study for two reasons. (1) It is hard to record accurately the verbal responses made, especially when pronunciations deviate from the accepted standard. Babbling and "baby talk" vary from child to child, and an accurate recording of the exact sounds produced is almost impossible. (2) It is difficult and sometimes impossible to stimulate talking at will. Many times, young children refuse to talk in the presence of a stranger. The result is that the psychologist is often forced to rely upon information from parents or others, which varies in accuracy according to the care with which the information has been obtained. For example, in recording the first word used or the size of the vocabulary of the child at a given age, does the parent use the two criteria of speech, that it must be pronounced in an understandable way and that the child must know the meaning of the word he uses?

PATTERN OF SPEECH DEVELOPMENT

Learning to speak is a difficult task. There is no single speech organ ready for use at birth or even shortly afterward. Speech is produced by the coordinated activity of the lip, tongue, and throat muscles, as well as by the larynx and lungs. It takes time and practice on the part of the young child to perfect the coordination of these organs.

Speech development follows a pattern much the same for all children. While it is true that some children learn to talk more quickly than others, this acceleration is an accompaniment of rapid development along other lines, notably muscle coordination. What deviations from a characteristic pattern exist are, for the most part, trivial and the product of different environmental conditions than those commonly found.

Technique.—The technique of learning to speak is that of the "conditioned response." If a word is said by another when an object is given to the baby, the baby learns that that particular combination of sounds stands for the object presented.* The more often the baby or young child sees an object when the name of that object is given, the more quickly he will emerge from the "parrot" stage, in which he merely imitates words he has heard, and progress into a phase of language development that may justifiably be called "true speech." In Fig. 31 the way the young child learns to speak is well illustrated.

* How important a role training plays in learning to speak has been investigated by experiments designed to test the relative effectiveness of

learning and maturation. Using the co-twin control method, Strayer (1930) took a pair of identical twins who, at the age of eighty-four weeks, were near the threshold of language acquisition. The trained twin, Twin *T*, was given an intensive vocabulary training for 5 weeks, beginning at the age of eighty-four weeks and lasting through the eighty-eighth week. The control twin, Twin *C*, was given 4 weeks of training, beginning at the age of eighty-nine weeks and extending through the ninety-second week.

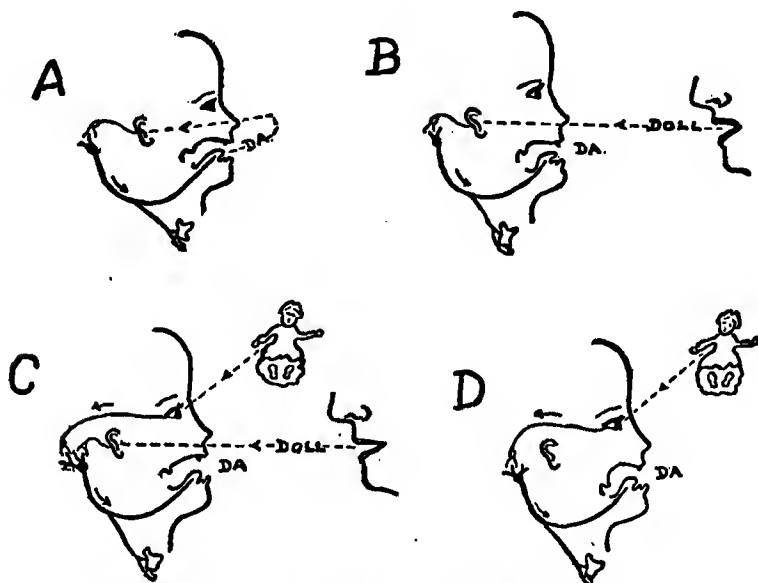


FIG. 31.—Development of language habits in the young child. (From F. H. Allport, *Social psychology*. Houghton Mifflin, 1924.)

A, Stage 1; random articulation of syllables with fixation of circular responses. Chance articulation of the syllable *da* causes the baby to hear himself say it. The auditory impulse is conveyed to the brain centers where it discharges into the efferent neurones to muscle groups used in pronouncing the same syllable. An ear-vocal habit for *da* is thus established. B, Stage 2; evoking of the same articulate elements by the speech sounds of others. An adult speaking the word "doll," which is closely similar to *da*, causes the auditory excitation again to discharge into the response *da*. C and D, Stage 3; conditioning of the articulate elements (evoked by others) by objects. In C the process shown in B is repeated. A doll shown at the same time stimulates the baby's eye, and forms a visual connection with the motor neurons being used in pronouncing the syllable. There is thus established a conditioned response between the sight of the doll and the speaking of *da*. The sight of the doll alone (D) is now sufficient to evoke its name (*da* being as close as the baby can come to the pronunciation of "doll").

The maturational difference of 5 weeks was found to have a definite influence on the relative effectiveness of training. Not only did the training of Twin *C*, begun five weeks later than that of Twin *T*, prove to be more effective, but the responses made were more mature. Twin *C*, after 4 weeks of training, had seven more words in her vocabulary than had Twin *T* after an equal amount of training. Twin *T*'s pronunciation at the end of the experiment was better than that of Twin *C*, owing, in all probability, to a longer practice period in the case of the former.

The Plateau Stage.—The pattern of speech development is marked by spurts and resting periods. One of the resting periods, when little or no progress is made, is often referred to as the "Plateau Stage." This is reached between the ages of nine and eighteen months and coincides with learning to walk. As is true of adults, the baby is incapable of giving conscious attention to two things simultaneously. Because at this age walking and talking both require conscious attention and directed effort on the part of the baby, the baby chooses the activity he wishes to follow. Since walking, at that age, is more useful to him than talking, because it relieves the extreme helplessness that comes from inability to move without aid, the urge to walk seems to be more powerful than the urge to talk. After walking becomes habitual, the baby's attention is again directed toward talking, and a spurt in learning to talk follows.

Shirley (1933) found that babies vocalized less than usual during the time a new motor act was being established. For example, between the ages of fourteen and twenty-three weeks, when reaching for objects develops as a motor skill, she reported that the babies studied by her vocalized less than between the fifth and thirteenth weeks. Vocalization then increased from the twenty-fifth to the thirtieth week, decreased at the thirty-first week, owing to sitting alone, and remained low during the thirty-third and thirty-fourth weeks, the median age for creeping. After walking was established as a motor skill, the amount of vocalization increased rapidly, in fact, far ahead of the prewalking period.

Significance of Good Model.—As the child imitates the speech of those about him, whether it be good or bad, it is essential that he have a good model to copy. The child imitates defective speech, such as poor pronunciation and grammatical errors, as readily as he imitates correct speech. If parents use "baby talk," as, for example, "choo-choo" for "train" and "tick-tock" for "clock," the baby will acquire a "baby talk" vocabulary. Even stuttering and stammering are sometimes traceable to imitation.

PRELIMINARIES TO SPEECH

The communication needs of the baby are expressed by gestures and expressive vocalizations rather than by speech. Vocalization, in the form of cries, explosive sounds, or "babbling," does not become a form of language until meaning is associated with the sounds made. When that occurs, the baby can communicate with those who know him well enough to understand what he is attempting to say, even though his vocalization may be meaningless to strangers.

Shirley (1933) reports that the median age at which the first comprehensible word was spoken in the examiner's presence was sixty weeks,

while Gesell (1928), in his normative summary, claims that the normal child says two "words" at twelve months and four words at fifteen months. At the latter time, he also uses expressive jargon. That means that for the first 12 to 15 months of a child's life, his communication is in forms preliminary to speech.

Prespeech Forms.—There are three preliminary forms of communication commonly used by babies during the first months of life, which serve them temporarily as satisfactory forms of communication. These are (1) *crying*, (2) "explosive sounds" which soon develop into *babbling*, and (3) *gestures*. Of the three, the second is the most important from the long-range point of view because it becomes the basis for real speech. During the early months of life, however, crying is the most frequently used of the three.

1. *Crying*.—Beginning with the third week of life, the crying of the baby becomes differentiated so that it is possible for those who are familiar with babies to know what the tones and intensities of the cries signify. Crying, Bühler (1930) found, during the first months of life is traceable to bodily hurts and needs such as (1) pain, especially when related to digestion, (2) strong sensory stimuli, bright light, sharp noises, heat, or cold, (3) abrupt changes of posture or uncomfortable positions, (4) strong disturbances during sleep, (5) fatigue, (6) hunger, (7) failure of the intended reaction, such as inability to move due to restricting clothes or covers, (8) loss or removal of playthings (from the fifth month), (9) fear (from the eighth month), and (10) when contact with others is withdrawn (from the third or fourth month).

VARIATIONS IN CRYING.—From the second month of life, the baby's cry is no longer a monotone but varies in intensity, tonal quality, and rhythm. Pain cries are, for example, shrill, loud, and interrupted by whimpering and groaning, or short, sharp, and piercing. The cry of discomfort is low and whimpering, while that of hunger is loud and interrupted by sucking movements. Bayley (1932) observed that crying caused by fatigue is often accompanied by yawning, drooping, and rubbing the eyes, while crying caused by strangeness of place or persons in a mental-test situation is accompanied by clinging to the mother and turning away from the experimenter. Variations of crying, such as groaning, "fussing," whimpering, and sighing appear by the end of the second month, while by the age of five months each baby makes sounds of displeasure characteristically his own.

The baby soon learns that crying brings attention and pleasant results. He therefore learns to use crying as a means to an end. It is very easy to tell if crying is for this purpose and if the baby is becoming "spoiled." If such be the case, the baby will stop crying as soon as someone pays attention to him and, by smiling or other signs of pleasure, will show that

all is well. This is very different from the cries of pain, hunger, cold, or some other physiological need which persists even after another person enters into the situation.

2. *Explosive Sounds and Babbling.*—In addition to cries, many simple sounds are heard during the first months of life. Sounds heard during the first 30 days of life have been recorded by Blanton (1917). She found that the consonant sounds most often heard were *M* in conjunction with *A*, as *MA* (at), *N* as *NCA* (nat), *G* as in *GAH*, *H* as in *HA* (at), *W* as in *WAH* (at), *R* as in *RAH* (at), *R* as in *BURR*, and *Y* as in *YAH* (at). The vowel sounds most commonly heard were *O* as in "owl," *E* as in "eel," *OO* as in "pool," *A* as in "an," and *A* as in "father." In addition to these, many simulated animal cries, such as the bleat of the goat, the whine of a young pig, and of the wail of a wild cat, were readily distinguished.

These early sounds are explosive in character and are caused by chance movements of the vocal mechanism. They are unlearned and are universally found in all races and nationalities. They are found even among the deaf. Because they have no significance for the baby, and will have none until they are used as a means of communication, they may be regarded as a playful activity in that they give enjoyment to the baby. This type of vocalization is commonly referred to as "cooing." Gesell and Thompson (1934) have reported that at eight weeks, 42 per cent of the babies observed cooed and three-quarters or more at the ages of twelve and sixteen weeks.

Gradually, the number of sounds the baby can produce increases so as to include most of the vowel and consonant sounds necessary for speech. By the third or fourth month, the baby has learned, from practice, how to control the flow of air over the vocal cords, and he can therefore produce sounds at will. By the sixth month, practice in vocalization makes it possible for the baby to combine certain vowel and consonant sounds as "ma-ma," "da-da," "na-na," or "bah-bah." Babbling is thus a form of vocal gymnastics, voluntarily produced, with no real meaning or associational value for the baby.

During the "babble age," which on the average extends from the third month to a peak at the eighth month, the baby derives keen enjoyment from listening to his own babbling. This is shown by the fact that babies babble more frequently when alone than when they are with others who can amuse them. It is especially evident in the case of deaf babies who begin to babble at the usual age but who soon lose interest in this form of vocalization because they cannot hear the sounds they make. Latif (1934) found deaf babies babbled less than normal babies.

BABBLING SOUNDS.—It is almost impossible to record accurately the babbling of a baby because the sounds made are not like those used in

speech. The observational studies that have been made show that babbling is more individual in content than it is generally believed to be and that, while there is a wide range of sounds made, there is also much repetition. The baby selects from the sounds he can make those which appeal most to him and then repeats these constantly, laughing and gurgling with enjoyment at his achievements. He is actually engaged in a form of self-imitation.

The first babble sounds are vowels, usually "a" and "u," and the first consonant used is generally "m." Shirley (1933) observed the following combinations of sounds at five months: "uggle-uggle," "erdah-erdah," "oddle-oddle," and "bup-bup-bup." With practice, the baby increases the number and combinations of sounds made. He acquires variations in pitch and inflection so that his babbling takes on a conversational tone.

At no time is babbling linked with specific objects, people, or situations. It is a form of playful activity which is engaged in only so long as the baby enjoys it or until an opportunity arises for another form of play of a more enjoyable type. While babbling at first serves no immediate purpose other than the pleasure it gives the baby, if continued, it soon proves to be a splendid opportunity to learn to control the different muscles connected with the speech mechanism.

3. *Gestures*.—The third preliminary to speaking consists of the use of gestures. The baby quickly learns to use gestures as a means of expression and through them communicates with others. Commonly observed gestures during early babyhood are pushing the nipple from the mouth with the tongue, turning the head away from the nipple, or allowing food to run out of the mouth, which shows that the baby is not hungry; smiling and holding out the arms, indicating that the baby wants to be picked up; squirming, wiggling, and crying during dressing or bathing, which show that the baby resents the restrictions to his activities.

The difference between the baby's use of gestures and that of the adult is primarily due to a difference in purpose. The baby uses gestures as a substitute for speech, to enable him to express thoughts, feelings, and emotions for which he has no other means of expression. In the case of the adult, on the other hand, gestures are used as a supplement to speech, to emphasize the meaning of the words spoken and thus to make them more forceful and effective. When the baby learns to say words and later to combine words into sentences, he has less and less use for gestures. In communities, therefore, where the frequent use of gestures is regarded as bad form, the young child gradually abandons the use of gestures and substitutes words for them.

Gesell's Norms.—Gesell (1928) has given the following norms for prespeech vocal activities:

- 1 month: Has differential cries for discomfort, pain, and hunger.
- 2 months: Makes several different vocalizations.
- 4 months: Vocalizes in self-initiated sound play (babbling).
- 5 months: Vocalizes displeasure on withdrawal of coveted object.
- 6 months: Vocalizes several well-defined syllables. Actively vocalizes pleasure with crowing or cooing.
- 9 months: Says Da-da or equivalent (pp. 128-132).

MAJOR TASKS IN SPEECH DEVELOPMENT

The child, in learning to speak, has four major tasks that must be mastered. These are interrelated, and successful achievement in one is essential to successful mastery of the others. The four tasks, each of which will be discussed in detail, are (1) *comprehension of the speech of others*, (2) *building a vocabulary*, (3) *combining words into sentences*, and (4) *pronunciation*.

1. COMPREHENSION

Comprehension of the meaning of the speech of others precedes the use of words and, at every age, the passive or "comprehension" vocabulary is larger than the active or "speech" vocabulary. This is much the same as occurs when an adult learns a foreign language. The adult understands words spoken by others and can follow a conversation in that language before he can talk intelligibly to others or take part in a general conversation.

Because comprehension is not based alone on an interpretation of the words heard but on an understanding of the facial expressions and gestures used in accompaniment to the words, comprehension is an easier task than speaking. A young baby, by the age of three months, smiles in response to the smile of another. The facial expressions and sounds closely related to such emotions as fear and anger are recognized soon afterward. From then on, his ability to understand gestures and facial expressions increases, and this aids him in comprehending words.

Similarly, gestures convey meaningful associations to a baby long before he comprehends spoken words. In fact, it is often difficult to tell how much of a little child's comprehension is owed to an understanding of the words themselves and how much to facial expressions and gestures. Very young children learn to comprehend the meaning of commands, such as "No-no," "Stop," "Come here," or "Lie down," partly because of an association with the act, as lifting the hand when the words "No-no" are spoken, and partly through an interpretation of the tone of voice used by the individual who gives the commands. Up to the age of eighteen months, words must be reinforced with gestures if the speaker wants to be sure that the child will comprehend what he

hears. Even simple directions, such as "Put the cup on the table," need to be supplemented by a gesture of pointing to the table and to the cup.

Norms for Comprehension.—Information regarding what may be expected of the normal child so far as speech comprehension is concerned comes from standard tests of intelligence and normative summaries. In the Terman-Merrill (1937) scale of intelligence tests, a block, spoon, apron, toy cat, cup, and thimble are placed in a row on a table, and the following requests given: "Give me the kitty," "Put the spoon in the cup," and "Put the thimble on the block." At the age of two years, the child should comprehend well enough to respond correctly to two requests, and at $3\frac{1}{2}$ years to the three requests. At the age of $2\frac{1}{2}$ years the child is shown a large paper doll, and is requested to "Show me the dolly's hair," mouth, ear, and hands. At four years, comprehension in the second degree is tested by the child's response to such questions as "Why do we have houses?" or "Why do we have books?" Kuhlmann (1922) asks children of that age: "What must you do when you are sleepy?" "What must you do when you are cold?" "What must you do when you are hungry?"

2. BUILDING A VOCABULARY

Two Forms of Vocabulary.—In the development of vocabulary, two distinct forms may be recognized. (1) *The general vocabulary*, consisting of words with a general meaning that can be used in a variety of different situations. Such words as "man," "beautiful," and "go" belong to this class. (2) *The special vocabulary*, consisting of words with specific meanings which can be used only for certain situations. Because words of the general vocabulary are more useful than those with specialized meanings, they are learned first. At every age, the general vocabulary is larger than the special vocabularies.

1. General Vocabulary.—In the development of a general vocabulary, the young child does not learn all parts of speech simultaneously. Rather, he learns first the words that will be most useful to him and which are easiest to learn, like the names of objects or persons. He learns last the parts of speech which are least useful and most difficult to use, the pronouns, for instance, because he can readily substitute nouns or gestures for them.

The first words used by the child are *nouns*, generally consisting of monosyllables, taken from favorite sounds the child has babbled. Later, these are doubled or trebled. These words are used to designate persons or objects in the child's environment, such as "mamma," "dada," "choo-choo," or "babe." Sometimes they have been learned by imitating the words the child has heard others use; sometimes a word learned for one object is applied to all objects of a similar nature, as "doll" for

all stuffed toys or "bonn" (bonnet) for all head coverings; and sometimes the name originates as a pure invention on the child's part, probably from the sound the object makes, like "dong-dong" for "train" or "tick-tock" for "watch."

After the child has learned enough nouns to apply names to the people and objects in his environment, he begins to learn *verbs*, especially those which designate action, "give," "take," "hold," and so on. *Adjectives* and *adverbs* appear in a baby's vocabulary from the age of 1½ years, while *prepositions* and *pronouns* appear last. The adjectives most commonly used at first are "good," "bad," "nice," "naughty," "hot," and "cold," which are applied principally to people, food, and toys. The earliest adverbs to appear in the child's vocabulary are generally "here" and "where." The difficulty the young child experiences in trying to discover when to use "me," "my," "mine," or "I" to refer to himself causes no small amount of confusion and thus results in his avoiding their use as long as possible.

General Vocabulary at Different Ages.—At fifty-two weeks of age, Gesell and Thompson (1934) report, the words used by babies fall into the following classifications: (1) things to eat, (2) qualities of objects, (3) activities or relationships, (4) inanimate objects, (5) persons, (6) exclamations to attract attention, (7) relating to self, (8) animals, (9) interjections, and (10) social intercourse. An analysis of the spontaneous conversations of two- and three-year-olds led Smith (1926) to conclude that at two years, verbs, nouns, and pronouns were the parts of speech most frequently used, while at the age of three, verbs and pronouns predominated.

An analysis of the parts of speech used by children of different ages was made by McCarthy (1930) and the results presented in Table XIX. In early babyhood, the largest percentage of words used consisted of nouns, but this percentage decreased rapidly from 50.0 per cent at eighteen months to 23.4 per cent at three years, because there was an increase in the use of other forms of speech. Verbs, adjectives, pronouns, conjunctions, and prepositions also increased in the frequency of use, the most pronounced increase being in the case of the latter two. Interjections, on the other hand, decreased from 7.6 per cent at eighteen months to 1.5 per cent at three years, while the number of adverbs in use remained practically constant.

As the child reaches the school age, his general vocabulary increases rapidly, partly as a result of direct teaching of words and their meanings by his teachers and, later on, partly as a result of reading for pleasure. How great the increase will be from year to year depends to a large extent upon the educational and cultural advantages present during the school and college years.

TABLE XIX.—MEAN PERCENTAGE OF EACH PART OF SPEECH BY CHRONOLOGICAL AGE AND SEX
(Based on Total Number of Words Used)

C.A., months	Sex	Nouns	Verbs	Adject.	Adv.	Pro- nouns	Conjunct.	Prep.	Interj.	Misc.
18	B	43.6	16.7	5.1	5.1	12.8	0.0	0.0	16.7	0.0
	G	51.5	13.1	10.7	8.5	9.8	0.6	0.0	5.5	0.3
	All	50.0	13.9	9.6	7.9	10.3	0.5	0.0	7.6	0.3
24	B	49.3	15.3	5.8	3.7	15.0	0.0	2.0	3.4	5.4
	G	35.5	22.6	11.6	8.0	14.5	0.7	4.1	2.2	0.8
	All	38.6	21.0	10.3	7.1	14.6	0.5	3.6	2.4	1.8
30	B	25.4	24.9	14.4	6.3	21.0	0.5	4.3	1.5	1.8
	G	26.0	22.3	14.3	6.9	17.6	2.5	4.9	3.8	1.7
	All	25.8	23.4	14.3	6.7	19.0	1.7	4.6	2.8	1.8
36	B	23.6	23.5	15.4	7.8	21.3	1.1	5.4	1.5	0.6
	G	23.2	22.5	16.7	6.3	17.3	3.7	8.4	1.5	0.5
	All	23.4	23.0	16.1	7.0	19.2	2.4	6.9	1.5	0.5

Source: McCARTHY, D. A. *The language development of the preschool child*. Minneapolis: Univ. Minn. Press, 1930, p. 114. Quoted by permission.

2. Special Vocabularies.—Early in childhood, when attention is concentrated on the development of a usable vocabulary, the child has little time to build up special vocabularies which, on the whole, are more superfluous than essential. From the age of three years, however, special vocabularies are built up at the same time that words of general usage are being learned.

The most important of the special vocabularies, and the ages at which they are developed, are as follows:

a. The "Trick" Vocabulary.—This consists of words pronounced correctly by the child in response to the request of another. The little child is asked to say long and complicated words, like "Mississippi," "esophagus," and "Wanamaker's," for the delight of the adults who hear him. As the child rarely ever knows the meaning of the words he speaks, their use is therefore merely a form of "showing-off." The age at which the "trick" vocabulary is most used is between one and two years.

Often during late adolescence, between the ages of seventeen and twenty years especially, boys and girls build up a "trick" vocabulary of long and unusual words, the meanings of which they know. They are used by the adolescents to give them a sense of importance and superiority, especially in the presence of others who show, by their facial expressions, that they do not understand the meaning of the words.

These "trick" words are frequently learned in connection with a high-school or college course.

b. *The "Etiquette" Vocabulary.*—This type of special vocabulary consists of such words as "please," "thank you," or "I'm sorry." The child should learn to use these words as soon as he can speak coherently and, by the age of five or six years, should have an etiquette vocabulary as large and as well developed as that of the adults of his environment. How large this vocabulary will be is entirely dependent upon the training the child has received.

c. *Color Vocabulary.*—Because of the young child's interest in color, names of different colors are learned at an early age. In the 1922 Stanford Revision of the Binet-Simon scale, Terman (1922) has placed the color-naming test, in which the child is asked to name without error the colors red, green, blue, and yellow, at the age of five years. However, most children of normal intelligence, from average or even inferior environments, know the names of the primary colors before that age. Cook (1931), in a study of color naming among children, ranging in age from seventeen months to six years, found that by the age of two years the children could name accurately, in 25 per cent of the cases, the four primary colors, red, green, yellow, and blue and, by the age of six years, the ability to do so had increased to 62 per cent.

d. *Number Vocabulary.*—While many young children of $2\frac{1}{2}$ or 3 years of age can count up to 10 or more, it is questionable whether they understand the meaning of the words they use. Their number vocabularies therefore fall into the category of "parrot speech." However, through play or direct teaching, the child gradually learns the meaning of many numbers. According to the 1922 Stanford Revision, the child of six years should be able to count to 13, pointing to pennies while he counts, to show that he understands the meaning of the words he uses. In the 1937 Revision of the Stanford-Binet Test, the child is expected to be able to count three objects, blocks, beads, or pennies, at the age of five years and, at the age of six years, know the meaning of the words "three," "nine," "five," "ten," and "seven" well enough to count out the number of blocks requested from the twelve that are placed before him.

e. *The Time Vocabulary.*—Because of the diversity of activities characteristic of the different parts of the day, the child comes to know the meaning of words related to them. By the age of six or seven years, the child should know the meaning of such simple words as "morning," "afternoon," "night," "summer," and "winter." When he enters school, he soon learns the names of the different days of the week and months of the year.

f. *The Money Vocabulary.*—While to the very young child, all coins are "money" or "pennies," to the child of four or five years, the different

coins begin to have specific names, according to their size and color. How large the child's money vocabulary is depends upon the child's environment. Children of poorer environments have, as a rule, larger money vocabularies than children from the better neighborhoods because they are often entrusted with money when sent on errands by their parents. According to the 1922 Stanford Revision, the child of six years should be able to name pennies, nickels, dimes, and quarters. Before the high-school age, the youth should know the names of all forms of currency in common use in his own country.

g. The Slang Vocabulary.—"Slang" is a form of unauthorized speech. This means that slang words are not to be found in a dictionary, or their use is not sanctioned by authorities on correct speech. Should these words prove to be offensive to those who hear them, they are generally referred to as "swearing." The dividing line between "slang" and "swearing" thus depends primarily upon the personal reaction to the words heard.

During childhood, the use of slang or swear vocabularies is purely imitative and without any real significance so far as the user is concerned. The child uses words of this sort to identify himself with the older children or to show off by shocking the adults of his environment. In the poorer neighborhoods, the slang vocabularies of young children are, on the whole, larger than those of children of better neighborhoods where, as a rule, children hear fewer words of this type. Likewise, sex differences are negligible.

From the age of seven or eight years, the use of slang is no longer imitative or "show-off" in its purpose but rather serves as a means of expressing feelings and emotions for which the child has no adequate form of vocal expression. While the child may invent some of the swear or slang words he uses, this vocabulary is, for the most part, an imitation of the words used by high-school students. He thus not only has the satisfaction of a readily usable vocabulary for emotional expression but he also has the added satisfaction of self-importance which comes from identifying himself with high-school or college students.

SLANG IN ADOLESCENTS.—Slang and swearing play an important role in the speech of the adolescent. To the adolescent, words of this sort not only offer him an adequate form of expression for his emotional experiences but they also help him to create the impression that he is a "good sport" and not stilted or smug in his point of view. Melville (1912), in a study of the use of slang among a group of high-school students, found the reasons most frequently given by the students for the use of slang were: "Use it from habit," "Slang is more expressive," or "Slang expresses feeling better."

During adolescence, there are generally two age peaks in the use of slang. The first peak occurs during the freshman and sophomore years



FIG. 32.—Secret language. (From C. Brownstone, *Why children's secret language?* *Parents' Magazine*, May, 1940. Illustrations by Dorothea Warren. Courtesy of *Parents' Magazine*.)

of high school, at approximately the ages of fourteen and fifteen years, while the second peak occurs at a similar period in the college course, from seventeen to nineteen years. This second period is more pro-

nounced when the adolescent goes to college than when he enters business at the end of his high-school career.

Sex differences in the use of slang and swearing from the beginning of the school age have been found to exist. Girls, Conradi (1903) found, use milder terms to express their feelings than do boys, who favor words of a rougher, more objectionable form that closely resembles swearing. Girls, likewise, were found to use slang less frequently than boys. Melville (1912) reported that there was a $33\frac{1}{3}$ per cent greater number of slang expressions used by boys than by girls. Boys, as a rule, take keen delight in using slang at times when it attracts attention, such as in the presence of adults, and they thus add to their feeling of self-importance.

After the child enters school, the social environment is less important in determining the amount of slang used than in the preschool days. Boys and girls from superior social and cultural environments use slang freely at the typical "slang ages," and the slang they use consists of what is in vogue at the time.

h. Secret Language.—A very common accompaniment of the pre-adolescent gang behavior is the development of a secret language in the form of "pig Latin," written symbols, or signs made with the fingers. The purpose of such language is to enable the child to communicate with the other members of the gang without having the gang secrets made known to those outside the gang. The beginning of the secret-language age comes around the eighth year and extends to approximately the fifteenth year, with a peak between the tenth and thirteenth years. While both boys and girls use secret language in its different forms, it is, however, more popular among girls than among boys. Girls delight in spending hours trying to develop words, signs, or symbols that cannot be understood by the uninitiated. Figure 32 illustrates three forms of secret language.

Size of Vocabulary.—How many words will appear in the child's vocabulary at different ages depends to a large extent upon the intelligence of the child, what chance he has had to learn new words, and whether there has been an incentive to learn words. Numerous studies of the vocabularies of young children at different ages have been made but, owing to the fact that different-sized groups have been studied and different techniques used, there is little agreement in their findings. A brief summary of a few of the studies will, though, give a general idea of the approximate size of a child's vocabulary at different ages.

At the age of nine months, most babies can say "mamma" and "dada" and, at the age of one year, can say two or three words other than "mamma" and "dada." Smith (1926) has reported the average size of vocabulary at ages ranging from one to eighteen years, and Terman (1922) has estimated the average size of vocabulary at different ages

from the Stanford-Binet vocabulary test. The combined results of their studies are presented in the accompanying table.

TABLE XX.—SIZE OF VOCABULARY AT DIFFERENT AGES

Age, Years	Number of Words
1.....	2-3 (Smith)
2.....	272 (Smith)
3.....	896 (Smith)
4.....	1540 (Smith)
5.....	2072 (Smith)
6.....	2562 (Smith)
8.....	3600 (Terman)
10.....	5400 (Terman)
12.....	7200 (Terman)
18.....	15,000 to 19,000 (Smith)

In McCarthy's (1930) study of the speech of preschool children, an analysis of the number of words used, as well as the number of different words used, was made. These data, which show a distinctly smaller vocabulary in the preschool years than Smith reported, are presented below:

TABLE XXI.—MEAN NUMBER OF WORDS AND MEAN NUMBER OF DIFFERENT WORDS USED
By Chronological Age and Sex

C.A., months	Mean number of words			Mean number of different words		
	Boys	Girls	All	Boys	Girls	All
18	8.7	28.9	20.3	5.4	13.6	10.0
24	36.8	87.1	66.0	16.6	37.3	29.1
30	149.8	139.6	143.7	52.8	49.8	51.0
36	164.4	176.2	170.3	60.1	66.0	62.8
42	200.8	208.0	203.7	76.7	90.6	82.3
48	213.4	218.5	216.3	91.1	93.8	92.6
54	225.4	236.5	230.5	95.8	104.0	99.5

Source: MCCARTHY, D. A. *The language development of the preschool child*. Minneapolis: Univ. Minn. Press, 1930, p. 113. Quoted by permission.

3. FORMING SENTENCES

"Single Word" Sentences.—Combining words to form sentences generally begins before the child's second birthday. In the earliest sentences, one word alone is used, a noun or verb that, when combined with a gesture, expresses a complete thought. For example, "give," when accompanied by pointing to a toy, means "give me the toy." The word "ball," when accompanied by the holding out of the arms in the direction of the ball, means the same thing. This "single word" type of sentence is used first from approximately twelve to eighteen months of

age, after which the child begins to put two or more words together and supplements these with gestures.

Early Word Combinations.—The child's first attempt at sentence formation consists of combining two or more words, formerly used singly, into a phrase, which is supplemented by gestures. These do not make a complete sentence, for pronouns, prepositions, and conjunctions are rarely used. Nice (1933) has reported the average age for early word combinations to be 17.5 months; Shirley (1933) has given a median age of 101.0 weeks, and Gesell (1928), 21 months.

By the time the child is two years old, he combines words into short sentences, most of which are incomplete, but which nevertheless express, with the aid of gestures, a complete thought. These sentences contain one or more nouns, a verb, and occasionally adjectives and adverbs. The less essential words, such as prepositions, pronouns, and conjunctions, are omitted. Typical sentences of this type are: "Hold doll." "Go bed." "Go bye-bye." "Want drink."

Muntz (1928) found that 60 per cent of the two-year-olds whom he studied used sentences. At the age of 2½ years, McCarthy (1930) reports, the average length of sentence is 3.1 words, at 3 years, 3.4 words, at 4 years, 4.4 words, and at 4½ years, 4.6 words. At that age, sentences are complete or made up of two short sentences connected with the word "and." The tendency to omit the verb, McCarthy found, reaches a peak between twenty-five and thirty months of age and then decreases.

From mothers' reports of sentences used by their children, Gesell (1940) has compiled the following examples of sentences that normal children of twenty-four months of age use:

Papa gone.

Come, Kitty.

I see Daddy.

Cup all gone.

Where's Daddy gone?

Get the — (one word completion).

I want my cup.

You get it for me.

Shut that door.

I want some more.

Where's the ball, Mamma?

I see Daddy go bye-bye car.

I put it on the chair.

I don't want to go to bed.

Take 'em and put 'em in there.

Mother, why me left in bed?

Don't forget the 'nanas.

Harold's out in the yard.

Baby sat in my lap.

(Page 197)

Complete Sentences.—Between the third and fourth years, children normally speak in complete sentences in which all parts of speech are used. From then on, their speech should be practically at the level of adult speech. Typical examples of a 3-year-old's sentences are: "I not a bird," or "I bigger Howard"; and of a 3½-year-old, "If a house is on fire, put water on it. Then it will not make holes in it. And you can live in it forever." (Nice, 1925a).

By the age of six years, the child should have command of practically every form of sentence structure. The length of the sentence, Davis (1937a) found, increases with age up to 9½ years. The sentences of young children are apt to be loosely constructed and complex in character, with a large percentage of adverbial clauses and a small percentage of noun clauses. When his attention is concentrated on some topic or situation, he is apt to use very long sentences made up of a number of short sentences joined together with "and" or "but."

Grammatical Errors.—Grammatical errors are common up to the age of three years. This is due to the difficulties the young child has in putting words together. His major problems are in the use of pronouns and verb tenses. At the age of two years, few children use pronouns correctly, while at the age of three years, about 75 per cent do. The confusion of single and plural tenses is likewise great, and, unless corrections are made when errors occur, the child forms the habit of making grammatical errors. Errors of this sort are especially frequent in homes where poor grammar is common.

An investigation of errors in sentences made by children from two to six years of age was carried out by Smith (1933), who found the following frequencies per 1,000 words:

TABLE XXII.—FREQUENCY OF ERRORS PER 1,000 WORDS

Types of error	Age, months				
	24	36	48	60	66-72
Incomplete sentences:					
Copula omitted.....	38	15	4	1	1
Others.....	225	71	36	28	32
Articles.....	39	15	3	2	2
Verbs.....	30	24	17	12	11
Prepositions.....	11	8	5	2	4
Nouns and pronouns.....	6	4	2	1	1
Agreement.....	8	6	3	2	1
Confused parts of speech.....	3	5	1	1	½
Other errors.....	3	3	2	2	1

Source: SMITH, M. E. Grammatical errors in the speech of preschool children. *Child Developm.*, 1933, 4. Condensed from table on p. 184.

Typical examples of errors made were: verbs: use of "can" and "may," "lay" and "lie"; nouns: "mans" "foots," and "tooths"; articles: use of "a" and "an"; agreement of subject and verb: "it dont"; and confused parts of speech: "I am going to the low (bottom of page)," and "give me the rub (eraser)."

4. PRONUNCIATION

The pronunciation of words is learned by imitation in the case of young children. The child copies the sounds he hears and thus pronounces words as he heard others pronounce them. He pronounces words incorrectly as easily as correctly. In early childhood his ability to imitate sounds is so flexible that his entire pronunciation can readily change in a short period of time, should he be placed in a new environment where those with whom he associates pronounce words differently from those with whom he formerly associated. By adolescence, on the other hand, pronunciation has settled into a habit and is hard to change.

In Childhood.—There are marked individual differences in the child's ability to pronounce words. Some children speak so distinctly that they may readily be understood by others. On the other hand, equally as many children pronounce their words so poorly that a mother or nurse has to be called upon to interpret what they say. Even at three years of age, many children show traces of infantile pronunciation, such as "wain" for "rain" and "dat" for "that."

The child's pronunciation becomes increasingly comprehensible as he grows older. Most infantile forms are gone by the fifth or sixth year. The babyish accent, characteristic of the first years of life, gives way to a more mature tone of voice. While the voice is still high-pitched, the pronunciation of the child is clearer and stronger than that of the baby. Davis (1937a) found that children with faulty pronunciation used shorter sentences, had a more limited vocabulary, and lacked spontaneity of response compared with children whose pronunciation was more mature. From a study of preschool children, McCarthy (1930) reported that by the age of $3\frac{1}{2}$ years, the child's speech is almost completely comprehensible. This development occurs earlier in girls than in boys.

Correct pronunciation of the sounds of the English language by preschool children was studied by Wellman *et al.* (1931). One hundred and thirty-three sounds, including 66 consonant elements, 48 consonant blends, 15 vowels, and 4 diphthongs, were tested by presenting pictures to the children and recording in phonetic symbols the words given in response. At the age of three years, 82.5 per cent of the diphthongs, 75.2 per cent of the vowels, 68.4 per cent of the consonant elements, and 51.8 per cent of the consonant blends were correctly given as compared with the range of from 87.2 to 90 per cent at the age of five years. The sounds most often given correctly were 16 consonant elements, like "t," "p," "b," "m," and "n"; and four vowels, "i," "a," "e," and "u."

Tonal Qualities.—One of the most characteristic and, at the same time, unfortunate aspects of speech during the school years is the coarsening of the tonal qualities of the voice. This is not the result of maturation.

tion but comes from screaming and shouting which so invariably accompany play at that age. This strain on the vocal mechanism, at an age when it is not strong enough to withstand such strain, generally results in a coarsening of the tonal qualities to such an extent that it can never be overcome completely. To the child, this is of little importance, especially in the case of boys who assume the attitude that talking in a pleasant voice is a sign of a "sissy."

During adolescence, on the other hand, the coarsened tones which pleased the child are a source of much distress. As a result, the adolescent tries so hard to improve his speech that an "affected tone" is the usual outcome. Often, the adolescent pays so much attention to his pronunciation and tries so hard to develop a style which he considers attractive that his voice sounds unnatural and affected. This tendency is especially characteristic of girls and occurs generally between the ages of seventeen and nineteen years.

SPEECH DISORDERS

At the time when the young child is learning to speak, speech disorders are most apt to develop. Because of the difficulty the young child has in controlling his speech mechanism, disorders of one sort or another can develop just as readily as correct speech unless control is exercised by those who are responsible for the care of the child. The detrimental effect on the health, happiness, and success of the individual, not in childhood alone but throughout life, justifies the serious consideration given to any disorder in speech that may appear during babyhood or even as late as the adolescent years.

CAUSES OF SPEECH DISORDERS

Few speech disorders are hereditary. Occasionally a defect in speech can be traced to a tongue-tied condition, or to deformed teeth, palate, lips, or jaws. But the majority of speech disorders are due to environmental causes, faulty learning, caused by imitation of a poor model, such as a foreign accent, or attempts to speak quickly because of excitement. Imperfect hearing and muscular weakness of the tongue and lips, owing to lack of full use and excessive nervousness, may also be the causes of speech disorders.

TYPES OF SPEECH DISORDERS

Speech disorders may be divided, roughly, into two classes, (1) *errors* and (2) *defects*. The difference between the two is largely arbitrary and one in which the severity of the disorder is the outstanding characteristic. In the case of speech errors, the cause is primarily faulty learning, while

in speech defects, emotionality and malformation of the mouth may also be responsible for the trouble.

1. Speech Errors.—Speech errors, which are so common in babyhood, but which usually disappear by the time the child enters school, generally arise from faulty learning that has not been corrected by those in charge of the child. "Baby-talk," often regarded as cute, is in reality speech in which simple errors, easily corrected, are allowed to persist. A few of the most common of these, together with their causes are:

a. Omissions.—In words of two or more syllables, the young child often does not perceive accurately all the syllables that have been spoken. With this incorrect auditory image as a model, he attempts to imitate the spoken word as he remembers it. Generally, one or two syllables in the middle of the word, rather than at the beginning or end of it, are omitted. Typical examples of omissions are "hankchief" and "hanky" for "handkerchief," "scepy" for "sleepy," and "buttfly" for "butterfly."

b. Interchanges.—Difficult words, when heard only occasionally, are often remembered incorrectly, with some of the letters or syllables interchanged in position. These incorrect auditory images, from faulty auditory perception, could easily be corrected by the child if it were not for the fact that parents or others find the errors amusing and permit the child to continue using them until a definite word habit has been formed. Examples of interchanges are "aks" for "ask," "psoon" for "spoon," and "bicksit" for "biscuit."

c. Substitutions.—In substitutions, the speech error lies in the insertion of letters, syllables, or even totally new words for the words heard. Davis (1937*b*) found that the digraph "th" was the most difficult sound for the child to produce at all ages. Often "d" is substituted for "th," as in "dat" for "that" and "de" for "the." Early "baby talk" contains many substituted words in which the baby develops his own words for objects in his environment, the words coming often from the sounds made by the objects. Common examples of substitutions are "tick-toek" for "clock," "choo-choo" for "train," "babe" for "baby," "cawkee" for "coffee," and "laly" for "lady."

2. Speech Defects.—Speech defects are more serious than speech errors not only in their causes but also in their effects on the attitude and social adjustment of the individual in later life. Because of their seriousness, they have been more carefully studied than speech errors, and attention from both the physician and educator has been given to them. There are a number of speech defects, the most common of which are:

a. Lipping.—This consists of letter-sound substitutions, the most common form of which is the substitution of "th" for "s" or "z," as in

"Thimble Thimon" for "Simple Simon." Other common forms of letter-sound substitutions are "s" for "th" or "sh"; "sh" for voiceless "p"; "r" for "u"; or "u" or "y" for "r."

Two of the most usual causes of lisping are deformation of the jaw, teeth, or lips and a tendency to cling to infantile speech. In the case of the former, when the lower jaw protrudes beyond the upper, there is apt to be a slight lisp. During the transitional stage from first to second teeth, or the "toothless" age, there is often a lisp which, if not checked, may become a habit. Most lisping, however, is a type of infantilism. The child continues to talk in this babyish way because he discovers that others think it "cute" and laugh at him. In many cases, adults talk to him in lisping tones, in imitation of his lisp, giving him an incorrect model to copy.

Among preschool children, lisping is one of the most common speech defects. But because lisping is the source of much ridicule, most children whose lisp is not due to a physical cause learn to overcome it early in their school careers. The result is that there are few lispers to be found among high-school or college students.

b. Slurring, or Indistinctness of Speech.—Slurring is due to inactivity of the lips, tongue, or jaw. It is sometimes caused by paralysis of the vocal organs or lack of development of the tongue, especially of the musculature of the tongue, which often is an accompaniment of rickets. In other cases, an emotional attitude of timidity may be responsible for inactivity of the lips and tongue. The child frightened by the presence of other people keeps his lips partially closed and mumbles his words. Finally, it may be due to rapid speech, caused by excitement in which the child, in his haste to say all that he wants to say, rushes through the words without pronouncing each carefully and distinctly. This last cause is responsible for the cases of slurring that occur for the first time during the school years.

c. Stuttering.—This is found in about 1 per cent of the children of school age. It shows itself in many ways, primarily in repetition of the initial letters or syllables of a word or even in the repetition of the entire word. The spasms of stuttering differ in different individuals and also differ, from time to time, in the same individual. This defect is caused more by nervousness and emotional tension than by any other condition. It generally begins at a very early age.

Blanton (1929) studying 400 cases of stutterers, varying in age from eighteen months to thirty years, found that the major portion began to stutter at the age of $2\frac{1}{2}$ years, while the second most important period for starting to stutter was six years, when the child enters school. According to him, these two ages represent important breaks in the child's life. In the case of the first, the child is breaking away from babyhood, while

in the case of the second, he is breaking away from home environment and is establishing himself in a broader social environment.

Adjustments at both periods are difficult for the child and are accompanied by emotional strains that may readily lead to stuttering. Stuttering is therefore, according to Blanton, a symptom which expresses lack of adjustment to the group and is caused by conscious or partly sub-conscious fear of meeting the group. In different people, different situations give rise to stuttering. Some children stutter only in the presence of strangers, others only in the presence of their parents, while still others, only when called upon to speak in public.

d. Stammering.—This is a “deadlocking” of speech in which the individual is unable to produce sounds owing to the tightening of the vocal muscles. Like stuttering, it is caused by emotional tension, and its severity differs at different times depending on how much emotional tension is present. Generally it accompanies stuttering and results in a temporary blocking of a word, followed, as the muscular tension is released, by a flood of words which, in turn, will soon be checked by another spasm of stammering.

Sex Differences.—Sex differences in speech defects show a ratio of 2 to 1 in favor of boys. That means that, on the average, twice as many boys suffer from speech defects as do girls. Stuttering and stammering are much more frequent among boys than among girls. Likewise, slurring, especially when it develops for the first time during late childhood, more frequently occurs in boys than in girls. Lispering is the only one of the four common speech defects that occurs more often in girls than in boys.

Seriousness of Defects.—The seriousness of speech defects is not limited to the fact that each year they are allowed to continue makes it increasingly difficult to correct them. In addition to that is the social significance of the defects. Other children are intolerant of any defect in speech and are apt to make fun of one who is afflicted. It is not at all an uncommon thing for boys or girls to laugh at classmates who stutter, stammer, or lisp when they attempt to recite in class or when they talk to others during play. This ridicule soon develops a shyness and a feeling of inferiority on the part of the afflicted child, resulting in withdrawal from the group. The child who suffers from a speech defect is thus deprived of the training in social behavior which is so essential for successful adjustments in mature life. Boys and girls with speech defects rarely ever become leaders in high-school or college activities, nor do they rise to the top of their classes in scholastic work.

THE CONTENT OF SPEECH

What children talk about at different ages is important not only because it gives evidence as to the size of the child's vocabulary and

ability to combine words into sentences at different ages but also because it gives a clue as to the personality and the dominant interests of the child.

At first, the young child's speech generally accompanies *motor activity*. Running, playing, eating, and bathing all have some vocal accompaniment, whether shouts, grunts, squeaks, or words. All of these have a definite relationship to what the child is doing and are in reality a form of "thinking out loud." The little girl playing with her doll will say, "I cover dolly," as she puts a cover over the doll, even though there is no one in the room to listen to what she is saying. Smith (1926) holds that very little of the speech of a young child is conversational but rather approaches monologue in the form of a running commentary on his own actions.

In Childhood.—A number of scientific studies of the conversations of children at different ages have been made. Most of these consist of a careful record of what the children say at times when they are not aware of being observed. In early childhood, conversations relate for the most part to the child and his interests, while relatively few are devoted to topics in which the child is not involved. Piaget (1926) analyzed the spontaneous speech of children when with their companions and classified it in two categories, *egocentric speech* and *socialized speech*. In the former, the child either talks for himself or for the pleasure of associating with anyone who happens to be present, but it has no social function. This type of speech is seen in monologues accompanying action and soliloquies, occurring when the child is alone or with others who are paying no particular attention to him. The second type, *socialized speech*, occurs when social contacts are established between the child and his social environment. Piaget found that between the ages of three and five years more than one-half of the child's speech was egocentric, from five to seven years, approximately 45 per cent, and for two boys, age seven years, approximately 30 per cent was of this type.

Studies of larger groups of children than Piaget used have shown that, while young children's speech is *egocentric*, it is not so predominantly so as Piaget's results indicated. In a functional analysis of the speech of 140 preschool children, McCarthy (1929) found only about 10 per cent of the responses were egocentric. The peak of this sort of response occurred at the ages of twenty-four and thirty months. Criticism, dramatic imitation, and questions and answers were less predominant at the early part of childhood but showed a marked tendency to increase with age. While Fisher (1934) noted a high proportion of remarks about the self up to five years, there was also an increase in remarks about other people and about objects.

The most frequent topic of conversation that nursery-school children engaged in, Sprague (1929) noted, related to themselves and their activ-

ities. When a second person was the subject of a remark, the remark was usually a command for that person to do something. Murphy's (1937) observations of the conversations of preschool children led her to conclude that, at the age of three years, many topics of conversation, characteristic of adults in our society, appear in a rudimentary form in the conversations of children. Topics such as clothes, likes, and dislikes among people, where one lives, and matters of everyday routine predominate.

Home Interests.—Preschool children devote nearly one-third of their words and expressions to family concepts, related to mother, father, sibling, and home. Shirley (1938) reported that emotional references to the family are very frequent and show the child's feeling of insecurity, as when a two-year-old boy called "mammie" and showed no interest in play with other children, and five-year-olds asked, "When is my mother coming?" or said, "I wish my mother would hurry up and come." This is a form of *socialized speech*, as Piaget described it, because through speech the child is establishing contact with the group.

Questions and Commands.—Two of the most common forms of socialized speech in childhood are questions and commands. In both cases, there is a decided increase in number from two to five years. At two years, Smith (1933a) noted that questions, for the most part, take the form of "what" and "where," as questions relating to the whereabouts and names of persons and objects. As children approach the fourth year, "why," "how," and "when" questions are most frequent. Girls, as a rule, ask more questions about the names of things, places, and social rules, while boys use "how" and "why" more. The number of questions asked decreases with age, though at all times children from the upper occupational groups ask more questions than those of the lower groups, and only children more than those with siblings in the family.

In Adolescence.—What the adolescent talks about is difficult to discover because free discussions in the presence of an adult occur infrequently. In a study by Stoke and West (1930) (see Fig. 33), one student member from each of a number of adolescent groups recorded the conversations of the other members of the group. In that way, a real sampling of adolescent conversations was obtained. The topic of greatest interest proved to be sex. Social problems of a personal nature, such as drinking and sex, were more often discussed than social problems of an impersonal sort, like world peace and communism.

Marked sex differences in topics of conversation among adolescents are common. Girls are more interested in cultural topics such as music, travel, drama, and art than are boys, while drinking, inventions, and sports are more often discussed by boys than girls. Topics of sex interest, such as "dates," dancing, kissing and necking, and marriage, as well

as discussions about smoking, "shady stories," and university regulations, showed no real sex difference. Clothes, which in studies of adults have been found to be discussed chiefly by women, received as much attention from the adolescent boys as from the girls. Conklin (1935) reports that in a study of over 2,000 university students, 22 per cent of the male conversations and 25.5 per cent of the female conversations were about sex.

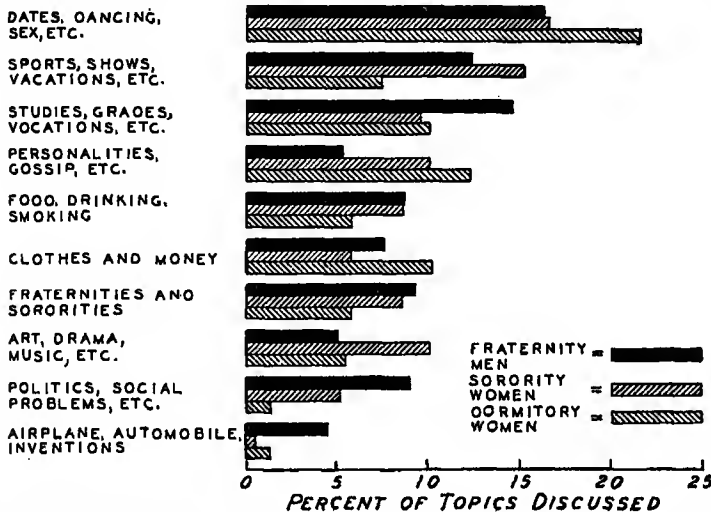


FIG. 33.—Relative importance of conversational interests as revealed by the type of topics discussed by fraternity men, sorority women, and dormitory women. Based on a regrouping of data of S. M. Stoke and E. D. West, Sex differences in conversational interests. *J. soc. Psychol.* 1931, 2, 120-126. (From F. K. Shuttleworth, *The adolescent period. Monogr. Soc. Res. Child Developm.*, 1938, 3, No. 3.)

DELAYED SPEECH

The normal child should begin to talk when he is about fifteen months old. If, by the time the child is two years old, he is not talking, there is need for investigation to discover the cause. The most common causes of delayed speech, or speech below the standard for a child of a given age are:

1. **Intelligence.**—In babies of normal intelligence, first speech appears, according to Mead (1913), at an average age of 15.8 months, compared with 34.44 months in the case of the feeble-minded. Terman (1925) reports the average age for the first word in the case of gifted children to be 11.74 months for boys and 11.01 months for girls. The size of vocabulary at every age depends so much upon the intellectual development of the individual that many psychologists believe one of the best single tests of intelligence is a vocabulary test.

2. **Social Environment.**—Studies of the relationship between speech and social environment have shown that children of the poorer social

environments are delayed in speech development as compared with children of the better social environments. This may be due to differences in intelligence, or to opportunities to learn, or to both.

Hetzer and Reindorf (1928) studied two groups of young children, nine to thirty months old, in day nurseries, one of which was in a good neighborhood and the other in a poor one. They found that when the children's vocalization was purely "instinctive," as in crying, no difference between the two social classes was apparent. But, in all other forms of verbal activity, the children of the laboring class lagged behind those of the better group. The degree of retardation was especially apparent in the size of vocabulary, in which the children of the poorer group lagged from 9 to 12 months behind those of the better group. In sentence usage, there was a 4 months' retardation, and in first use of different parts of speech, a 6 months' retardation.

In a comprehensive analysis of the behavior of kindergarten children, half of whom came from good, and half from poor environments, Gesell and Lord (1927) found that the outstanding difference between the groups was the amount of conversation used by the children. Spontaneity and expressiveness were almost lacking in the group from the poorer neighborhood but were in constant evidence in the group from the better environment. The children of the poorer group shouted and laughed during the free-play period, but with few exceptions they did not talk to one another or to the group as a whole. Articulation of children from the upper occupational groups is superior to that of the lower occupational groups (Davis, 1937b).

3. Illness.—Should severe or prolonged illness occur in childhood, the child is cut off from contacts with other children and, as a result, his speech development suffers. Added to this is the fact that he has little incentive to talk because he is not feeling well or because what he wants is done for him and his every desire is anticipated.

The effect of severe illness during the first two years of life on the speech development of a group of children has been studied by Smith (1931). Comparisons were made with a control group made up of children who had not suffered from serious illnesses during the first years of life. In the case of the control group, the average age at which the child first spoke words was 10.261 months, while in the case of the sick group, it was 11.126 months. Phrases were first used by the control group at the age of 14.487 months and by the sick group at 16.450 months.

4. Inadequate or Defective Model.—Many children of average or superior intelligence are slow in starting to talk and have vocabularies more limited in size than one would expect them to have. This often occurs in the case of institutional children, children brought up by foreign nurses who are themselves handicapped by lack of knowledge of the

English language, or children who are segregated from other children, as is often true in the case of children of very wealthy parents.

Because the child learns to speak by imitation and because he copies the model of speech of those with whom he is most frequently associated, it is quite understandable that he cannot learn to speak better than those who serve as his models. Even when the little child has, from the adult point of view, a good model to copy, it may happen that the adult speaks too rapidly for the child to understand, and this makes imitation impossible.

5. Negativism.—Many young children, on the threshold of learning to talk, develop a rebellious attitude toward talking because they have been forced to talk before they are ready to do so. Too much urging or coaxing thus results in antagonism toward talking, with the result that the young child stubbornly refuses to speak, though he is able to do so. Even after a child has learned to talk fairly well, he may develop a negative attitude toward speech because of fear of being laughed at or because his babyish pronunciation is regarded as "cute" and he is urged to repeat words for the amusement of adults.

6. Deafness.—A young child who is deaf or hard-of-hearing is certain to be slow in learning to talk and to have a poor pronunciation compared with other children of the same age and intellectual development. Likewise, the deaf child will, at every age, have a smaller vocabulary than other children. The reason for this is obvious. Because the child learns to talk through imitation, he is greatly handicapped if he cannot hear what others say, and as a result, he lacks an adequate model to imitate.

7. Bilingual Speech.—Because of the commonly accepted belief that it is easier to learn to "talk like a native" in a foreign language before one is five years old rather than later, many parents have their children taught some preferred foreign language while learning their native tongue. This is very apt to delay the child's learning to speak because of the confusion that results when the child tries to say one thing to one person in his native tongue and the very same thing to another person in a foreign language. His thinking, likewise, is apt to be confused, and he is therefore self-conscious about talking because he is not quite certain about the correct word to use on that particular occasion.

Learning two languages simultaneously necessitates the learning of two words for every object the child wishes to name or every thought he wants to express. It also requires the learning of two sets of grammatical forms, one generally in direct conflict with the other. This is no easy task for a high-school student, so it is readily understandable that it is an extremely difficult task for a young child. Smith's (1935a) study of eight children of the same family who used both English and Chinese revealed that the children used sentences in which words of both

languages were mixed together and that many errors occurred. With increases in age, the mixed sentences and errors decreased.

8. Sex.—Children of the male sex are, on the average, slower in learning to talk than children of the female sex. Girls have been found to talk slightly sooner than boys of the same intellectual level and to have a larger vocabulary. Boys of normal intelligence, Mead (1913) reports, begin to talk first at an average age of 15.76 months and girls at 14.88 months. McCarthy (1930) found that girls were superior to boys in the mean length of response made and that, at the age of 18 months, only 14 per cent of the boys' responses were comprehensible as compared with 38 per cent of the girls. This difference persists as children grow older. Vocabulary tests show girls to be superior to boys at every age. Likewise, fewer grammatical mistakes are made by girls than by boys.

9. Twins.—Studies of twins have shown that they, as a rule, learn to talk more slowly than single children because each imitates the speech of the other and consequently does not have as good a model to copy as if imitating an older child or an adult. Day (1932, 1932a) contrasted the speech development of twins with that of singletons and found that in the size of vocabulary, mean length of sentence, and articulation, twins were retarded as contrasted with singletons of the same age. They also started to talk on an average of one month later. Retardation in speech development on the part of twins increased from two to five years of age, but by the age of nine, they had partially overcome their language handicap, if they came from homes in the upper occupational groups. Only children, on the other hand, were found to be definitely superior to children with siblings in every phase of linguistic skill (Davis, 1937b).

CHAPTER VIII

EMOTIONAL DEVELOPMENT

Beginning with the undifferentiated type of emotional responses that have been found by recent experimental studies to exist at birth and shortly afterward, the young child develops certain emotional patterns which may readily be recognized in his behavior. Before the end of the first year, his emotional expressions are so clear-cut and definite that they are easy to interpret, and thus it is possible to know, in a more or less specific way, what the child's thoughts and feelings are, even though he is still too young to talk in an understandable fashion.

As the child becomes older, he displays an increasing repertoire of emotional responses, recognizable to adults as *joy*, *anger*, *fear*, *jealousy*, and *hate*. These forms of emotional behavior can be aroused by a wide range of stimuli, including objects, people, and situations which were originally ineffective. What, then, causes this emotional development and what evidence have we to show to what extent one factor rather than another plays an important role in its development?

HOW THE EMOTIONS DEVELOP

Emotional development is due to *maturation and learning*, not to either one alone. The fact that a certain emotional reaction does not appear early in life is no proof that it is not innate. It may develop later with the maturing of the intelligence of the child, which results in keener perceptions and an increased capacity to distinguish between persons, objects, and situations. This causes the child to react in different ways to the same stimulus at different ages.

Emotional reactions may also come from the increased activity of certain of the endocrine glands which have been relatively inactive since birth. Through learning, objects and situations, which at first failed to call forth emotional responses, later come to do so as a result of conditioning, or learning by association. Learning and maturation are so closely interwoven that it is at times difficult to determine the relative effects of the two.

1. Role of Maturation.—Experimental studies of the role played by maturation in the development of the emotional life of the child have been limited to the early years of childhood. Evidence obtained from these studies, however, is adequate to show how important maturation

is, especially as the child's emotions are already in a well-developed form by the time he enters school.

The most satisfactory scientific method of discovering the importance of maturation consists of isolating the child from social stimulation immediately after birth. Then, at certain specified times, the child's reactions to stimuli which, under normal conditions, are known to call forth emotional reactions would be observed. Should the child show emotional reactions similar to those displayed by other children of the same age and intellectual level, it would be positive proof that the emotion had developed naturally. Lack of emotional reaction, on the other hand, would show the importance of learning.

Carrying out an experiment of this type would, for obvious reasons, be impossible. Hence, the scientific study of a deaf and blind girl, made by Goodenough (1932), is of great value because of the light it sheds on this problem. Goodenough took moving pictures of the emotional reactions of a ten-year-old girl who had been blind and deaf from birth. The girl showed joy, resentment, temper tantrums, timidity, and other emotions similar to those of normal children in spite of the fact that, because of her handicaps, she had had no opportunity to learn them. This, Goodenough pointed out, would suggest that the overt characteristics of the emotions were obviously unlearned.

Gesell (1929) has used the isolation technique to study the role played by maturation in the emotional development of a baby who was confined in a small enclosed space, 2 by 3 by 4 feet, well ventilated, illuminated, and completely harmless. At the age of ten weeks, the baby accepted the situation with complete complacency. At twenty weeks of age, he showed mild intolerance, dissatisfaction, and apprehension, while at thirty weeks of age, his intolerance was vigorously expressed by crying. This led Gesell to conclude that the genetic graduation of fear behavior thus displayed was based upon maturational sequence rather than upon conditioning.

Genetic Sequence in Emotions.—Genetic studies of groups of babies and young children have revealed a patterned sequence in emotional development similar in its major aspects for all members of the groups. From data obtained from observations made by parents, specially trained for this, Blatz, Bott, and Millichamp (1935) found a genetic sequence for 18 emotional responses in the case of five children ranging in age from one month to two years. Each type of emotional response seemed to appear at a particular period, and with increasing age there was a continual change in the form the response took.

In the table below, the ages at which specific emotional responses appeared are listed. The blank spaces at succeeding age levels indicate that the response, which appeared earlier, continued to appear. For

example, crying and screaming appeared first from one to four months but continued for the remainder of the study. Running away began at the twelve to sixteen-month period. Only unpleasant emotional responses are listed, not because the children studied were devoid of pleasant emotional experience, but, as the authors explain, the parents perhaps

TABLE XXIII.—ORDER OF APPEARANCE OF FORMS OF BEHAVIOR DURING EMOTIONAL EPISODES FOR ALL FIVE CHILDREN

1 to 4 months	4 to 8 months	8 to 12 months	12 to 16 months	16 to 20 months	20 to 24 months
Crying Screaming Restless Struggling Starting	Refusing and resisting Holding out arms Throwing things Crying and calling	Stiffening Throwing self back Clinging Crying and attempting	Running away	Hiding face Crying and saying "no"	Slumping crying and asking

Source: BLATZ, W. E., BOTT, E. A., and MILLICKAMP, D. A. *The development of emotion in the infant*. Toronto: Univ. Toronto Press, 1935, Child Development Series, no. 4, p. 19.

regarded smiling, laughing, and other indications of pleasure as not being emotional.

A glance at the table will show that with age, emotional responses are less diffuse, random, and undifferentiated. They become more specialized and directed toward the situation in which they occur as the child grows older. For example, crying and screaming are apparent early in in the child's emotional behavior, as may be seen by the fact that they

occur in the one- to four-month period. Crying and saying "no," on the other hand, do not occur until much later, in the sixteen- to twenty-month period.

In a similar study in which large groups of foundling-home children were observed, Bridges (1932) noted a genetic sequence in emotional development. Beginning with undifferentiated excitement, present at birth, she concluded that all emotional responses are derived as a result of maturation and conditioning. These are general and poorly organized

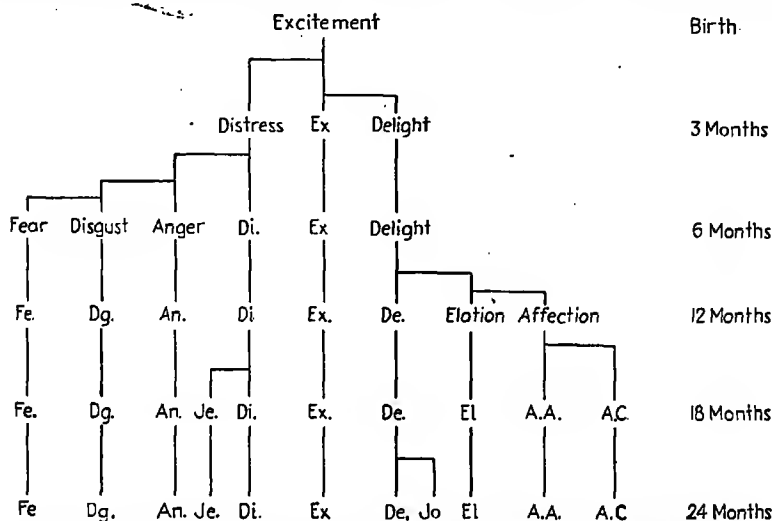


FIG. 34.—Showing the approximate ages of differentiation of the various emotions during the first two years of life. [Key: A.A. = affection for adults, A.C. = affection for children, An. = anger, De. = delight, Dg. = disgust, Di. = distress, El. = elation, Ex. = excitement, Fe. = fear, Je. = jealousy, Jo. = joy.] (From K. M. B. Bridges, *Emotional development in early infancy*. *Child Developm.*, 1932, 3.)

at first but, with time, take on a more definite form. In the accompanying figure, Fig. 34, are given the emotions that, according to Bridges, are evolved from undifferentiated excitement and the approximate ages at which each appears.

According to this, distress appears first at the end of the first month, delight by the end of the second month, and affection around the eighth month. The last emotion is then differentiated into affection for adults and affection for children between the thirteenth and fourteenth months. Emotional development does not stop at twenty-four months of age, the highest level given by Bridges. True grief, which involves an understanding of the situation and the ability to imagine oneself in the position of the individual who is experiencing the grief, is a more highly developed emotional reaction than "distress," as given by Bridges, and develops much later than at the age of two years.

Genetic Development of Fear and Crying.—Several scientific investigations have been carried out to determine whether specific emotional responses follow a genetic pattern in their development. In a study of fear reactions, Jones and Jones (1928) asked children and adults to handle a harmless snake, nearly 6 feet long, which glided about actively and frequently protruded a black forked tongue. Up to two years of age, they found no fear in the children studied. By 3½ years, on the other hand, caution about approaching and touching the snake appeared, while, at the same time, the children seemed to pay greater attention to the snake than before. After four years of age, definite fear appeared.

TABLE XXIV.—THE RELATIVE OCCURRENCE OF CRYING AT EACH MONTH

Causes	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
	Percentage of All Causes											
Specific test situation..	27.3	38.6	28.0	30.0	35.1	33.7	36.8	33.0	27.9	28.8	29.4	33.0
Handling.....	25.5	10.8	14.0	16.0	14.9	14.9	17.2	13.2	19.8	20.7	20.6	19.4
Fatigue.....	20.0	30.1	21.5	23.0	14.0	13.9	6.9	7.5	10.8	9.0	4.9	8.7
Internal conditions....	5.5	3.6	4.3	0.0	3.5	2.0	6.9	5.7	3.6	1.8	3.9	1.0
Colic.....	12.7	4.8	6.5	2.0	2.6	2.0	0.0	1.9	0.0	0.0	0.0	0.0
Sleepiness.....	1.8	1.2	2.2	4.0	7.0	4.0	4.6	7.5	8.1	6.3	5.9	2.9
Hunger.....	3.6	2.4	5.4	9.0	2.6	3.0	2.3	2.8	0.9	0.9	2.0	3.9
Strangeness.....	0.0	0.0	2.2	5.0	11.4	9.9	14.9	17.0	21.6	26.1	24.5	21.4
"Spoiled".....	3.6	4.8	5.4	6.0	5.3	7.9	9.2	9.4	5.4	3.6	5.9	6.8
Put down.....	0.0	1.2	7.5	3.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0
Interference.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0
Postural discomfort....	0.0	2.4	3.2	2.0	3.5	5.0	1.1	1.9	1.8	1.8	1.0	0.0
Adverse conditioning...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.0	1.9

Source: BAYLEY, N. Study of the crying of infants during mental and physical tests. *J. genet. Psychol.*, 1932, 40, 321.

As Jones and Jones claimed that the children could not have learned their fears through actual contact with the snake, pictures, or stories, it is evident that maturation was primarily responsible for the changed reactions. General physical and intellectual development, with consequent sensitiveness to certain aspects of their environment, plus a keener perception which caused the child to be startled by new and unusual things he could now recognize as such, were primarily responsible for the change. "Fear," they contend, "arises when we know enough to recognize the potential danger in a stimulus, but have not advanced to the point of a complete comprehension and control of the changing situation" (p. 143).

Daily observations by Bridges (1931) of the emotional behavior of nursery-school children over a period of three years showed that at first fear is general, more like a state of panic than specific in form. As the child grows older, however, fear responses become more specific. The child runs away, avoids situations which frighten him, withdraws partially, or holds himself aloof. Likewise, with increasing age, there is an increase in the use of linguistic responses accompanying fear, like "Take it away," "I don't want to go," and "It will bite me," in place of the crying which typically accompanied fear in younger children.

Bayley (1932) studied the crying of babies in connection with their monthly physical and mental examinations. In Table XXIV are given in percentages the frequency of the different causes of crying for the first twelve months of life:

It is apparent from this table that some causes of crying are outgrown and others acquired with age. In the early months of life, crying comes mostly from internal, organic causes like hunger, bodily pain, and distress. Later, it is aroused primarily by environmental causes, such as strangeness of the situation or dislike of unusual handling. This is the result of the intellectual development on the baby's part. Fear in strange situations increases as sensitivity to situations recognized as being strange increases.

2. Role of Learning.—The child is not born with innate emotional responses to any specific stimulus but learns to respond emotionally as a result of his experiences. He has, for example, no innate fears of a specific thing, such as fear of the dark or of high places. The maturation of his sensorimotor and intellectual abilities, which underlie his emotional behavior, results in an increased receptivity to the environment. Thus, in turn, the child becomes increasingly more susceptible to emotional stimulation by particular objects and situations. Through learning, objects and situations, which at first failed to call forth emotional responses, later came to do so as a result of conditioning or learning by association.

Conditioning.—The famous experiment on "Albert" by Watson and Raynor (1920) demonstrates how a baby learns to be afraid. Albert, at nine months of age, was shown a large number of objects, a rabbit, dog, monkey, white rat, and cotton wool. In no instance did he display fear. Later, he was conditioned to fear the white rat in the following manner. When the rat was first presented to Albert, he reached for it. At that moment, a loud noise was produced by striking a steel bar with a hammer behind the child's head. This resulted in a startled response on Albert's part and he fell forward on his face. The next time, when the loud noise accompanied the presentation of the white rat, he whimpered. After five more presentations of the rat and the noise, the rat was presented alone. Albert cried, withdrew, and showed a typical fear response. He

had thus learned by association, or by conditioning, to fear an object that originally aroused no fear response.

Carrying the experiment further, Watson and Raynor found that Albert's fear of the rat had spread to similar objects, such as a rabbit, dog, sealskin coat, and cotton wool, all of which had been shown to Albert before the conditioning experiment started, and for which he showed no fear whatsoever. It was thus apparent that fear of specific objects and situations had come about by transfer from similar objects and situations and was learned just as the fear of the rat had been learned.

How fears of certain specific events lead to fears of similar or associated events has been investigated by Jersild and Holmes (1935b, pp. 138-139). From the testimony of parents regarding the fears of their children, they found the following fears as derived from earlier fears:

Description of Prior Fear or Situation in Response to Which Fear Was Exhibited	Fear Described as Growing Out of the Prior Fear
1. Fright at sound of applause on radio	1. Fear of all radios
2. Sound of mouse running through bedroom	2. Fear of all "scratchy" sounds at night
3. Warned to shut cellar door "or a rat will come out and bite you"	3. Fear later exhibited when someone said, "That's a rat," when she was playing with a familiar toy rubber rat
4. Fear of mice and cockroaches after seeing signs of fright in parents	4. Fear of cracks after hearing that cockroaches live in cracks
5. Fright at sudden hooting of owl at zoo	5. Fear of familiar pet canary (not previously feared) following this incident
6. Startled by moving feathers	6. Fear of moving seaweed
7. Fear of bunch of black pansies at age of five months	7. Subsequent fear of all black objects
8. Moving balloon manikins	8. Fear of pictures of similar manikins
9. Balloon used for anesthetics during operation	9. Fear of all balloons or objects resembling balloons, including dirigibles in the sky and a spirometer
10. Elevators	10. Being shut in small space
11. Frightened when first saw narrow winding stairs in new house	11. Fear of all stairs for some time thereafter
12. Fright when attacked by police dog and subsequent fear of dogs	12. Fear of cats
13. Fear of a child wearing mask and staring through window	13. Fear of other masks, skulls, skeletons, and pictures of these
14. Old, wrinkled people	14. Fear that mother will die
15. Grandfather moves to strange new place	15. Fear that grandmother will move away and not come back
16. Fear at sight of man with legs amputated	16. Fear of crossing streets (danger of being run over, losing own legs)
17. Frightened when left alone in hospital	17. Fear of dark, fear of imaginary animals, and nightmares concerning animals

Description of Prior Fear or Situation in Response to Which Fear Was Exhibited	Fear Described as Growing Out of the Prior Fear
18. Fright when cat was caught in cellar fire	18. Fear for safety of cat in other situations
19. Fear of crossing streets after being hurt by car	19. Nightmares involving traffic accidents, fear of the dark following nightmares, and fear of being alone in room
20. Doctors and hospitals	20. Telephones and taxis (fear that they will be used to summon doctor or go to hospital)
21. Fear of nightmares	21. Fear of mosquitoes (result of identifying Russian word for "nightmares" with word for "mosquitoes")
22. Nightmares	22. Fear of the dark
23. Dreams about creature emerging from clock in hallway of child's home	23. Fear of same clock during the day
24. Kidnappers and murderers (beginning when told story about murdered girls)	24. Fear of going out alone
25. "Big Bad Wolf" (after hearing story of Red Riding Hood)	25. Fear of going into cellar "because wolf is there"
26. Death and cemetery	26. Fear when hearing the word "commisery"
27. Death and cemetery	27. Fear of dying (e.g., "Will I die before I finish drinking this milk?")

Imitation.—Emotional reactions to certain specific situations can be learned by observing them in others, as well as by conditioning. The child imitates the emotional behavior he observes in adults or children and responds in an emotional manner to situations that at one time were incapable of producing emotional responses. Hagman (1932) studied fear in preschool children and found a real tendency for the child to have fears corresponding to those of the mother. The correlation of the child and mother's fears was .667 (P.E. \pm .045). This he interpreted to mean that the child had learned to fear certain situations by observing the mother's fear in those situations.

CHARACTERISTICS OF CHILDHOOD EMOTIONALITY

To understand children's emotions, one must realize that they differ to a marked extent from the emotions of an adult. In babyhood, the emotional life is simple and spontaneous. No restraint is placed on the free and instantaneous expression of the emotions. Emotions come and go, their frequency depending partly upon the baby and partly upon his environment. After the emotion has spent itself, it is forgotten, and the baby is free from emotional strain until conditions give rise to a new emotional outburst. The period of unrestrained emotionality is very brief. Modifications of the crude expressions of his emotions come as a

result of social interference and demands from the adult world. By the end of adolescence, the child has learned to control and modify his emotional reactions to fit into the pattern approved by his social environment.

The emotions of the young child differ markedly from those of the late adolescent or the adult. An analysis of characteristic features of the child's emotions, contrasted with those of the adult, will make these differences apparent. These characteristics are:

1. Children's Emotions Are Brief.—Typically the young child's emotions last only a few minutes and then end abruptly. Because the child expresses his emotions in overt actions, he "clears his system," and, as a result, the emotion lasts for a relatively short time as contrasted with the long-drawn-out emotional reactions of the adult. As the child grows older, social restraints on the overt responses which formerly characterized his emotional reactions leads to "moods" or emotional states drawn out over a period of time and expressed slowly rather than in short, abrupt outbursts.

If the child is forced, by social restraints, to check anger or any other emotional reaction that the older members of his environment consider undesirable, the energy thus restrained must expend itself in some way. One of the most effective forms of expression is a long-drawn-out mood, characterized as sulking or bad humor. The typical moods of childhood are sulkiness from restrained anger; "scariness," "jumpiness," and timidity from repressed fear; and happiness or good humor from controlled joy.

When the child is with playmates of his own age, free from parental or other adult restraints, he expresses his emotions freely and quickly. In the presence of adults, however, the child begins to display moodiness around the fourth year, and this tendency reaches its peak during adolescence. Because of this, adolescence is often called the "moody age."

2. Children's Emotions Are Intense.—The young child's emotional outbursts are characterized by an intensity which is seldom observed in the emotional reactions of an adult. His emotional responses lack gradations or degrees of intensity, with the result that his response to a trivial situation will call forth an emotional reaction of as great intensity as a situation of a more serious type. To adults, unfamiliar with childish behavior, the intense emotional reactions of a little child to a petty annoyance are the source of great surprise and wonder. This is especially true in the case of fear, anger, and joy, all of which are expressed in pronounced overt responses.

At a very early age, parents attempt to teach their children to control their emotional outbursts. Restraint comes through punishment, criticism, reasoning, or approval, depending upon the child's age and the environment in which he is brought up. The little child soon learns that

he will not be permitted to kick, bite, hit, or scream when he is angry or, if he runs and hides when he is frightened, he is apt to be laughed at and called "fraid cat." Even joy cannot be expressed naturally. The child must learn to control his desire to jump up and down, clap his hands, or shout with glee when things please him.

During the gang age, the child learns that temper tantrums, fears, jealousies, gloating over others, or even too much joy will not be tolerated by his playmates. He thus discovers that if he wants to be a socially acceptable member of the gang, he must keep his feelings and emotions under control and not give way to the intense outbursts which had, earlier in his life, proved to be such an effective method to use when he wanted to gain his wish at home. By the time he reaches the adolescent years, the child has learned that intense emotional reactions are regarded as infantile, and, to win the social approval which he so strongly desires, he makes a real effort to restrain his emotional behavior.

3. Children's Emotions Are Transitory.—The transitory character of the young child's emotions which results in a rapid shift from laughter to tears, from anger to smiles, or from jealousy to affection, is incomprehensible to many adults because it is so different from the way in which the typical adult expresses his feelings. The child's behavior, which at one minute is characterized by an intense outburst of one emotion, suddenly shifts to an equally intense outburst of a totally different emotional reaction.

This transitory characteristic of the child's emotional behavior leads many adults to question whether the child feels as deeply as an adult does. The rapid shift from one emotional response to another would suggest that he does not. But this may be due to other causes than shallowness of feeling. Because he expresses his emotions in an unreserved manner, thereby clearing his system of pent-up emotions; because of lack of complete understanding of the situation, owing to his immature intellectual development and limited experiences; and because of a shorter attention span which makes it possible for him to be diverted easily, the little child's emotions swing quickly from one emotional extreme to another. While they last, there is adequate reason to believe, from observations of the child's behavior, that he feels as deeply about the matter, in his own childish way, as the adult does.

4. Children's Emotions Appear Frequently.—Children's emotions occur more frequently, on the average, than do those of the typical adult. The reason for this is that as the child grows older, he has greater ability to make adjustments to situations that justifiably call forth emotional reactions than he had when he was younger and less experienced. Because he has learned that social disapproval or punishment often follows an emotional outburst, he tries to meet situations by reactions other than

emotional ones. The result is a gradual decrease in the frequency of emotional responses.

COMMON EMOTIONAL PATTERNS OF CHILDHOOD

After the early months of babyhood have passed, a number of differentiated emotional patterns, each with its own specific form of behavior, may be observed. The most common of the emotional patterns characteristically found in childhood, the stimuli which arouse them, and the form of response made, are given in the following pages:

1. FEAR

Fear is one of the most frequently experienced of the childhood emotions. Its effects on the physical and mental well-being of the child are so harmful that parents and teachers make every effort to eliminate its causes or, if that is impossible, to keep it from occurring in a pronounced form.

Origin of Fears.—While it is true that most fears are learned, they are nevertheless not all learned in the same way. Lawton (1938) has divided learned fears into three types, each of which has been acquired in a different manner. The first type consists of fears that originated through association with native or instinctive fears. "Albert's" fear of the white rat, described by Watson (1925) and reported earlier in the chapter, is characteristic of conditioned fears. The second type consists of fears that are acquired through direct imitation of those who are afraid, such as fear of thunderstorms which has been learned by imitating the fear behavior of a parent, brother, sister, or playmate.

The third type consists of fears that are an aftermath of unpleasant experiences, as may be found in fears of doctors, dentists, or dogs which have resulted from unpleasant experiences with each. Unpleasant dreams may give rise to such fears. Jersild and Holmes (1935) have reported that children become afraid of a thing after it has appeared in the setting of a terror dream. This may give rise to a new fear, or it may intensify an already existing fear. These terror dreams may occur as early as the third year and influence the day fears of the young child.

What Children Fear.—A number of experimental studies have been made to discover what young children fear. Watson (1925) showed babies a variety of animals, such as a black cat, rabbit, white rat, pigeon, and dogs; a bonfire made of newspapers; and animals in a zoo, especially reptiles, frogs, turtles, and snakes. As no fear occurred when any of these stimuli were presented, Watson concluded that only through conditioning would fear of animals or fire occur. The only native stimuli to fear, he contended, were loud, harsh noises or situations involving loss of support.

From direct observations by parents and other adults, from interviews with children, from case studies, and from observations of children in controlled-experimental situations, Jersild and Holmes (1935) found the objects most feared by children, three months to twelve years old, to be animals, such as dogs and snakes, dark rooms, high places, strange persons, and loud sounds. The least feared situations were insecure footing and being left alone. Parents' reports and experimental situations in which phonograph recordings of artificial thunder were reproduced with amplification led Hagman (1932) to the conclusion that the most common causes of fear in young children are dogs, doctors, storms, deep water, and darkness.

In experimental situations, duplicating eight commonplace everyday life situations that might arouse fear, Holmes (1935) reported the following percentages of fear responses for children twenty-four to seventy-one months old:

TABLE XXV.—NUMBER AND PERCENTAGE OF ALL CHILDREN WHO SHOWED FEAR IN RESPONSE TO THE VARIOUS EXPERIMENTAL FEAR SITUATIONS

Situation	Number of children studied	Number showing fear	Percentage showing fear
1. Being left alone.....	104	12	11.5
2. Falling boards.....	104	12	11.5
3. Dark room.....	104	43	41.3
4. Strange person.....	104	21	20.2
5. High boards.....	103	28	27.2
6. Loud noise.....	103	18	17.5
7. Snake.....	86	38	44.2
8. Large dog.....	56	28	50.0

Source: HOLMES, F. B. An experimental study of the fears of young children. In A. T. Jersild, and F. B. Holmes, *Children's Fears*. *Child Develop. Monogr.*, 1935, no. 20, p. 219.

As may be seen in the above table, the large dog, the snake, and a dark room proved to be the most effective stimuli in arousing fear, and being left alone or falling boards, the least effective.

Experimental studies have shown that children show fear in response to a wide variety of stimuli depending upon what they have learned to fear as a result of individual experiences. In spite of the large number of stimuli that have been observed to arouse fear in children, several characteristics stand out as all-important. This suggests that it is not the stimulus itself but rather *the way that it is presented* that determines whether or not a fear response will be aroused.

An important characteristic of all fear stimuli is that they occur suddenly and unexpectedly, which gives the child little opportunity to

adjust himself to the changed condition. Jones and Jones (1928) showed preschool children flashlights, false faces, stuffed animals, mechanical toys, and slimy or furry animals. The interesting finding that they reported was that not the object itself but its *suddenness* and *unexpectedness* were the characteristics which caused fear. The frog, for example, which made sudden jumps, was found to be especially frightening.

Similarly, fear of strangers, which most babies show between the ninth and twelfth months, is due in part to the fact that the baby is prepared to see a familiar person and is unable to adjust himself at first to the sudden appearance of a stranger. The fear of white rats, which Watson (1925) reported as being due to conditioning, was doubtless due in part to the sudden noise or loss of support that occurred unexpectedly when the baby was adjusted to reach for the rat. As the child grows older, and becomes more mature intellectually, he can adjust himself more quickly to sudden and unexpected circumstances.

Closely related to the qualities of suddenness and unexpectedness is that of *novelty* or *strangeness*. Stimuli that embody the element of novelty are apt to arouse fear, while the same stimuli, after the element of novelty has disappeared, will not arouse fear. Many instances of fear in the presence of familiar people can be traced to the fact that they are dressed in an unfamiliar way, as when the child's nurse wears her street clothes in place of the accustomed uniform. As soon as the child recognizes the nurse and the element of novelty in her appearance disappears, the fear itself disappears.

Effect of Child's Condition.—The child's condition, physical and psychological, at the time the fear stimulus is presented, will determine to a large extent how he will respond. If he is tired, hungry, or emotionally disturbed, he will respond with greater fear than if his condition were more favorable. Likewise, if he is alone, his reaction will be different than it would be if he were with his mother, nurse, or others in whom he has confidence. Should he remember similar experiences which, in the past, were unpleasant or even terrifying, he will react with fear to the new situation which, in and of itself, would normally not arouse fear but which reminds him of the old, terrifying experience.

Summary.—The experimental studies referred to above suggest that it is difficult to predict when a child will show fear and what will cause it. *Fear is not dependent on a given stimulus alone, such as a loud noise, but on the surrounding circumstances, the manner in which the stimulus is presented, the child's past experiences, the child's present physiological and psychological condition, and many related circumstances.* One child will respond with fear and another will show no fear in identical situations.

Fear Response Patterns.—Fear displays itself in an *attempt to withdraw* from the object that aroused it. Accompanying this is whimper-

ing, crying, a sudden and temporary holding of the breath, and a checking of the activity the child is engaged in. Under three years of age, the response occurring in fear is typically one of helplessness and the cry is the baby's call for help. He hides his face and gets as far away from the feared object as he can, by creeping or walking. He hides behind a

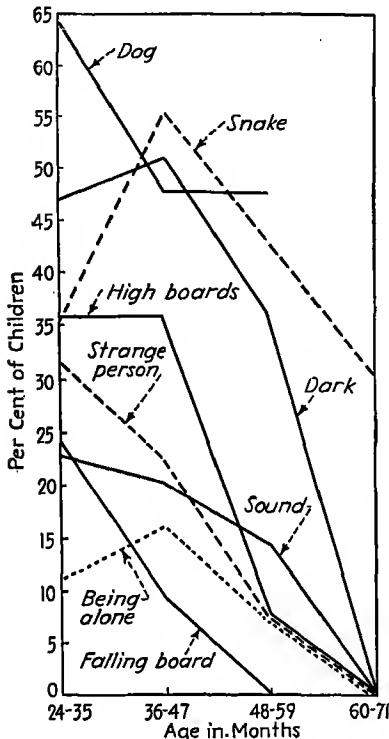


FIG. 35.—Percentage of children at yearly age levels who showed fear in response to the various experimental fear situations. (From A. T. Jersild and F. B. Holmes, *Children's fears*. *Child Developm. Monogr.*, 1935, 20.)

to read, his imagination, and his ability to see relationships between the new and the old, lead to the development of new fears, as well as a change in already existing fears.

In Jersild and Holmes's (1935) study, reported earlier in the chapter, it was found that, during the first two years of life, the children feared noises and objects, agents, or events associated with noise; strange, unfamiliar, or novel situations, objects, and persons; pain and tactual-sensory shock; falling, high places, and sudden displacements. Fear of animals was progressively more frequent up to four years and declined

person or a piece of furniture and remains there until the fear subsides, or until he feels that it is safe to emerge.

As the child grows older, these overt responses in fear are checked as a result of social pressure. The crying reactions cease, though the characteristic facial expressions remain and the child withdraws from the feared object. Shyness, as a type of fear reaction, was found by Shirley (1931a) to be common between the ages of eighteen months and two years. This took the form of playing with the toes or shoes, bending the head, hiding it behind the arms, and then coyly raising it to look at others. Girls, as a rule, show more pronounced fear reactions than boys at all ages.

Fears Change with Age.—Fear has been found to be a function of age. Situations which cause fear in young children, two to four years of age, are more matter of fact and less fanciful than those which cause fear in older children. As the child grows older, his understanding, owing to comprehension of words and pictures, his ability

afterwards. Fear of dark and being alone increased with age. In Fig. 35 are shown the percentages of children at different age levels who showed fear in various experimental fear situations.

With age, they found a *change in the type of object or situation* that aroused fear. There was a large decline in the frequency of fears in response to strange objects, persons, and situations; in response to noises and objects or agents associated with noise; and in response to sudden or unexpected visual phenomena. The largest decline was in the case of fear of strange events. Thus, it is apparent that there is a decrease of fears to concrete and tangible stimuli.

On the other hand, there was a marked increase in the frequency of fears of imaginary, fanciful, subjective, supernatural, or remote dangers; of the dark and imaginary creatures associated with the dark; of matters associated with death and corpses; of being alone; of bogies and other imaginary creatures; and of characters recalled from stories and pictures. There was also an increase in fears regarding possible accidents and injuries, through fire, drowning, and traffic; concerning loss or death of relatives, medical treatment, high places, ridicule, personal future, dying, and ill-health.

There is a definite and consistent *decrease in the number and severity of fears* as the child grows older. Jersild and Holmes (1935*b*) made a follow-up of fears in the case of 47 children thirty-four to eighty-three months old, 30 of whom they had studied at an earlier age. The average number of fears for the different age levels in their group was as follows:

Average for 3-year level.....	5.5 fears
Average for 4-year level.....	6.3 fears
Average for 5-year level.....	4.3 fears
Average for 6-year level.....	3.2 fears

Elimination of Fear.—The elimination of fears, especially those resulting from conditioning, is very difficult. M. C. Jones (1924*a*), in an experimental study of methods of eliminating fears in children, three months to seven years of age, found real success in only two, the method of "direct conditioning" and the method of "social imitation." In the former method, the fear object gave way to a craving object, by having the thing the child feared associated with the eating situation or some similar situation that is pleasant to the child.

The social imitation method is one in which fear is eliminated when the child who experienced the fear observes and imitates the behavior of a child who is not afraid in that situation. The other methods used by Jones, "verbal appeal," "elimination through disuse," "negative adaptation," "repression," and "distraction," sometimes proved to be effective but could not be relied upon unless used in combination with the other methods.

Jersild and Holmes (1935a) asked mothers of young children what they found to be the most effective methods of overcoming fears. The reports they received indicated that, in general, a technique which helps the child to become more competent or skillful and encourages him to undertake active dealings with the thing he feared is best. The methods used to attain this end were:

1. Encouraging the child to acquire skills that will be of a specific aid to him in dealing with the feared situation.
2. Leading the child gradually into active contact with the thing he fears, by presenting the stimulus at first in a less intense form and then gradually introducing all the conditions that initially evoked fear.
3. Giving the child an opportunity to become acquainted with the feared stimulus of his own accord.

As additional aids, Jersild and Holmes suggested using verbal explanation and reassurance, combined whenever possible with a practical demonstration of the nature and harmlessness in the child's presence, and reconditioning, by presenting the stimulus in association with an attractive stimulus.

Ineffective techniques, on the other hand, consisted of ignoring the child's fears; coercing the child to come in contact with the feared situations by physical force, scoldings, ridicule, or invidious comparisons; completely removing the cause of fear for the time; and offering palliatives for the child's symptoms of fear.

2. ANGER

Anger is a more frequent emotional response in childhood than fear (1) because there are more anger-provoking than fear-provoking stimuli in the child's environment and (2) because many children discover at an early age that anger is a good way to get attention or to satisfy their desires. Each year, as the child grows older, there is an increase in the number of situations that arouse his anger. The result is that the child *displays more angry reactions*, of one form or another, with increased age, *while the fear reactions decrease*, owing to his increased ability to realize that in most instances there is no real need for fear.

Stimuli to Anger.—In general, the *situations that give rise to angry responses* consist of those involving body restraint; interference with movements the child wishes to make either by others or by his own inabilities; blocking of activities already in progress; thwarting of wishes, plans, and purposes the child wants to carry out; or a number of cumulative irritations. In young children, anger is most often aroused in response to interference with physical activities or as a result of the child's own ineptitude. In older children, it comes from interference with possessions and plans or from ineptitude.

Experimental studies of anger have placed emphasis on the common causes of anger in young children. Jones, working with Watson, (1925) observed children, sixteen months to three years of age, continuously from morning to night, to find out what caused angry outbursts. More than 100 situations were found to arouse anger, the twelve most common of which, in the order of frequency, were:

1. Having to sit on the toilet chair.
2. Having property taken away.
3. Having the face washed.
4. Being left alone in a room.
5. Having the adult leave the room.
6. Working at something which won't pan out.
7. Failure to get adults or other children to play with them, or look at them and talk to them.
8. Being dressed.
9. Failure to get adults to pick them up.
10. Being undressed.
11. Being bathed.
12. Having the nose wiped. (Quoted by permission.)

Ricketts (1934) studied the angry outbursts of children in a preschool group and supplemented the information with observations made by mothers in the home. The situations in which anger was displayed, in the order of frequency, consisted of conflicts over playthings, conflicts over toilet and dressing, interruption of interesting activities, and thwarting of apparent wishes. The situations in which anger was least often displayed consisted of those in which the child was urged to eat or in which the part of another child was taken.

What specifically arouses anger in older children or adolescents has not been subjected to controlled-observational studies similar to those of the nursery-school years. It is a well-known fact, however, that any thwarting of desires, interruption of activities in progress, constant faultfinding, teasing, "lecturing," or making unfavorable comparisons with other children will lead to anger in older children, as well as in adolescents.

Anger Responses.—The form of expression of anger varies from one child to another, owing partly to environmental restraint and partly to learning. In babies and very young children, individual differences are much less pronounced than they are later in childhood and adolescence.

A very comprehensive study of anger in young children was made by Goodenough (1931) from records kept by mothers over a period of one month in which they kept accurate account of the anger displayed, the duration of the anger, and what had occasioned it. Forty-five children, ranging in age from seven months to seven years ten months, with I.Q. scores from 90 to 148, were included in the study. From this study, the following important facts about anger were brought out:

1. With advance in age, the percentage of outbursts in which energy was not directed toward any serviceable end, such as screaming, kicking, and holding the breath, gradually decreased.

2. The specific aspects of behavior during anger were

a. *Stamping*, ranging from 4.4 per cent in babies between the ages of one and two years, to 13.9 per cent among children of four and over.

b. *Kicking*, which occurs more frequently between the ages of one and two (27.7 per cent for two-year-olds) than at later ages (12.1 per cent for children of four and over).

c. *Jumping up and down*. This appears in about 4 per cent of the cases over one year of age and more often in boys than in girls.

d. *Striking*, which increases with age, from 2.8 per cent for the two-year-olds as compared with 11.5 per cent for those of four years and older. It is found almost twice as frequently in boys as in girls.

e. *Throwing self on floor*, which increases from 5.6 per cent for babies from one to two years to 10.0 per cent for children between three and four and then decreases to 3 per cent for children of four and over.

f. *Holding the breath*. This proved to be very infrequent and was reported in only 4 out of 1,878 outbursts.

g. Other forms of behavior, reported infrequently were stiffening the body, making the body limp, pulling away, struggling, pointing, and frowning.

3. In the case of vocal behavior, crying was most frequent up to the age of four years and then decreased. At every age, it appeared more frequently among boys than among girls. Screaming increased to the ages of two to three years and then decreased.

4. During the second year of life, the frequency of display of overt manifestations of anger reaches a maximum and then falls off rapidly. After that time, boys show more frequent and more violent anger than girls.

5. With advancing age, the child's anger response becomes more directed toward a given end, and there are more attempts to retaliate by hurting the feelings of the offender than by injuring the body. At the age of two years, only 10.6 per cent of anger was of this sort as contrasted with 28 per cent at the age of four years or older.

6. The more violent phases of anger become shorter with increase in age and, in place of violent outbursts, Goodenough found sulking, brooding, and whining.

7. Sex differences in the display of anger proved to be negligible up to the age of three years. At four years and over, the percentage of display of undirected energy during anger was 45 per cent for boys and 29 per cent for girls.

The typical "temper tantrum" behavior, described above, reaches its peak of severity between the third and fourth years. In a checkup study on children who had spent a year in nursery schools, Ricketts (1934) noted a decrease in anger manifestations, such as tantrums, stamping of feet, biting, snatching, kicking, crying, screaming, and calling for mother. This, Ricketts explained, was doubtless due to the fact that children learn that many of these methods are unsuccessful and socially disapproved in the school. Sulkiness, negativism, refusal to speak, fussiness, scolding, and quarrelsomeness are the common forms through which anger expresses itself in older children. The tendency to quarrel increases from seven to ten years, reaching its peak by the time the child is twelve or fourteen years old, and after that, decreases.

Duration of Anger.—The duration of anger outbursts changes little during the first eight years of life. In most instances, angry outbursts last less than 5 minutes (Goodenough [1931]). Ricketts (1934) reports that nursery-school children showed anger of the following durations: 41 per cent of the group studied, less than 1 minute; 48 per cent, between 1 and 5 minutes; and 11 per cent, over 5 minutes: at home, 15 per cent of the children showed angry outburst for less than 1 minute; 61 per cent, between 1 and 5 minutes; and 24 per cent, for over 5 minutes.

Individual Variations.—*Children differ greatly* in their susceptibility to anger. This is due partly to the heredity of the child and partly to his environment, especially the way in which he is dealt with by adults and other children. Goodenough (1931) found that the health of the young child was closely related to his display of anger. Any temporary condition of poor health tended to increase the frequency of temper outbursts. In the case of young children who have suffered from previous illness, anger was more frequently displayed than in the case of those whose previous health had been good. Likewise, Goodenough found, there was a positive relationship between the number of adults in the household and the frequency of anger shown.

As anger soon *settles into a habit*, if called forth frequently, it is obviously wise to avoid anger-arousing situations whenever possible. The child must learn when to become angry and when not. Thus, control consists of directing the use of anger into socially acceptable channels rather than restraining it. The child must learn, likewise, how to express his anger so as to avoid social disapproval. Good models of anger expression and self-control on the part of parents or other adults prove to be the best guarantee of self-control on the part of the child.

3. JEALOUSY

Jealousy is an outgrowth of anger. It is an attitude of resentment directed toward people, while anger may be directed toward people, toward oneself, or toward things. Jealousy may take the form of an outburst closely resembling a temper tantrum, but more often it is limited in its expression to an attitude. What causes it, and what form it takes, is greatly influenced by training and by the treatment the individual receives from others.

Stimuli to Jealousy.—The *situation* that calls forth jealousy is always a *social one*, involving people, especially those for whom the child has a feeling of affection. In the young child, it is the parents or other adults who have taken care of him who call forth jealousy. Because of the child's craving for attention and affection, he often finds himself in competition with another child. Clinical studies of jealousy in young children have shown that jealousy is a very common emotional experience,

originating, generally, with the birth of a younger sibling, when the child is from two to five years old. This does not necessarily occur. Watson (1925) reported that when a younger child was born into his family, the older child, age two to three years, showed no sign of jealousy.

How preparation for the arrival of a new baby in the household influences the attitude of the child has been investigated by Sewall (1930), in the case of children ranging in age from twelve months to five years ten months at the time of birth of the sibling. Of the 70 children studied, 33 had been told of the expected arrival and 37 had not. In the accompanying table may be seen the effect of this preparation:

TABLE XXVI.—RELATION BETWEEN THE CHILDREN'S ATTITUDE TOWARD THE YOUNGER SIBLING AND THEIR PREPARATION FOR HIS BIRTH

Attitudes	Prepared	Not prepared	Total
Jealous.....	19	20	39
Not jealous.....	14	17	31
Total.....	33	37	70

Source: SEWALL, M. Two studies in sibling rivalry. *Smith Coll. Stud. Social Work*, 1930, 21, p. 11.

These data indicate little difference in the behavior of the children and show that preparation is not a determining factor in the attitude toward the sibling.

In addition to jealousy, which occurs when a new baby arrives in the household, many young children show jealousy toward one parent, especially the father. Because of the child's constant association with the mother, he develops a proprietary attitude toward her and, as a result, resents her display of affection for the father. One of Watson's (1925) children, at the age of thirty-seven months, showed jealousy when the parents embraced each other, while the younger child, eleven months old, gave no indication of being jealous. Jealousy sometimes occurs in the younger sibling who resents the privileges given to the older children of the family. This attitude is often intensified by a show of favoritism on the part of one or both parents.

As children begin to develop interests outside of the home, around the fifth and sixth years, jealousy toward a member of the family becomes less pronounced. It may, however, show itself in the child's reactions toward schoolmates or classmates, especially toward those who excel in schoolwork or athletics or those who rank as the unquestioned leaders of the group. Jealousy appears almost universally as an accompaniment of adolescent romances and is pronounced in the case of girls. This will be discussed more fully in the chapter dealing with the love life of the child.

Jealous Responses.—The form jealousy takes in a young child is very similar to that of anger, but, unlike anger, it is always directed against another person. Its characteristic expressions include hurting the offender, reverting to infantile behavior, such as bed-wetting or thumb-sucking, making a bid for attention by pretending to be ill or afraid, refusing to eat, and general naughtiness. A characteristic jealous response is shown in Fig. 36.

Sewall (1930) reported the following methods of showing jealousy on the part of preschool children:

1. Bodily attacks on the younger sibling.....	26 cases
2. Ignoring the presence of the sibling.....	2 cases
3. Denying having a younger sibling.....	2 cases
4. No outward manifestation toward the sibling, but definite personality changes at the time of its birth.....	9 cases

In older children and in adolescents, jealousy is shown *directly* by verbal quarreling, telling tales, gossiping, disparaging comments, making fun of others, teasing, and instigating quarrels. *Indirect* expressions consist of daydreaming, especially of the martyr type, boasting, ignoring others, and sarcasm. Each child has his own individual method of showing jealousy which he has discovered, through trial and error, gives him satisfaction.

Individual Variations.—The amount and intensity of jealousy in children varies markedly. Definite *sex differences* in jealousy exist. Foster (1927) found that two out of three jealous children are girls. The *peak of jealousy* comes between three and four years of age, with another peak during adolescence. Jealousy is associated with *age differences* of eighteen to forty-two months (Sewall, 1930). Sixty-seven per cent of the children of that age difference showed jealousy as compared with 33 per cent whose age differences were greater or less than eighteen to forty-two months. There is more jealousy in children of the higher *intellectual* levels than in the lower.

The *oldest child* in the family is more often the jealous one than later born children (Foster, 1927). This may be explained by the fact that the *oldest child*, having been the center of attention before the new baby arrived, hates to share the parents' love with the younger children. A larger number of jealousy cases occurs in girl-girl combinations (60 per cent) than in boy-boy (44 per cent) or boy-girl (30 per cent) combinations (Smalley, 1930). In small families of two or three children, jealousy is a more common experience than in larger families or in families where there is an only child (Ross, 1930).

Jealousy is often a product of the home situation, Sewall (1930) noted, especially of the attitude of the mother and the method of discipline used.

The less attention the mother pays to her children, the less likely they are to be jealous. Oversolicitous mothers, on the other hand, have a high percentage of jealous children. Likewise, those who are inconsistent in discipline produce jealousy in their children more often than those whose discipline is more consistent. Jealousy is often intensified by parental



FIG. 36.—Jealous responses to a younger sibling. (From *Parents' Magazine*, December, 1937. Photograph by Vivien Rodvagin. Courtesy of *Parents' Magazine*.)

attitudes, especially those of nagging or unfavorable comparisons with other children in the household (Ross, 1930).

4. JOY, PLEASURE, DELIGHT

Joy, which in its milder forms is known as pleasure, delight, or happiness, is a positive emotion because the individual experiencing it makes no attempt to remove the situation giving rise to it. He accepts the situation or attempts to continue it because of its pleasant effects.

Stimuli to Joy.—The situations which give rise to joy differ from one age to another. The health and general bodily condition of the child also influence his emotional responses. As the child grows older, more situations and also more complex situations call forth the joyful emotions. They are always accompanied by smiling or laughing and can readily be detected because of these overt responses. Unlike the emotions already

discussed, joy is generalized and undifferentiated rather than specific in form.

The pleasant emotions are at first closely bound up with physiological well-being. Bühler's (1930) observations of *one-month-old* babies showed that a well-defined expression of comfort, apparent in glowing eyes, lifted corners of the mouth, and relaxing of the facial strain which accompanies close attention, could be observed when the baby was physically comfortable and happy after feeding or a good sleep, or in a dry, warm, and comfortable position. By the *second month*, laughing occurred in connection with such situations, but only when the babies saw or heard

TABLE XXVII.—SMILING AND LAUGHING OF BABIES

	Age, Weeks
Smiling:	
Social stimulation.....	8
Peekaboo. Cloth over subject's face.....	8
Rhythmical knee-drop.....	12
Threatening head.....	16
Elevator play.....	16
Tickling.....	16
Peekaboo. Cloth between examiner and subject.....	20
Sudden reappearance from under table.....	20
Rhythmical handclapping.....	20
Apparatus.....	20
Reappearance from cupboard.....	24
Laughing:	
Social stimulation.....	12
Peekaboo. Cloth over subject's face.....	16
Threatening head.....	16
Rhythmical handclapping.....	20
Rhythmical knee-drop.....	20
Elevator play.....	24
Sudden reappearance from under table.....	24
Peekaboo. Cloth between examiner and subject.....	24
Tickling.....	24
Sudden reappearance from under cupboard.....	44
Apparatus.....	56

Source: WASHBURN, R. W. A study of the smiling and laughing of infants in the first year of life. *Genet. Psychol. Monogr.*, 1929, 6, p. 491.

another person. Laughing proved to be more common than the negative reaction of crying. Similarly, Jones (1926) has reported that smiling in a social situation, when an adult leans over a baby and makes clucking sounds, appears first when the baby is thirty-nine days old.

The smiling and laughing of babies during the first year of life have been carefully studied by Washburn (1929) in the case of babies ranging in age from eight to fifty-two weeks. The general facial and bodily expressions, as well as the stimuli that arouse these forms of behavior, have been analyzed by means of observations supplemented by moving-

picture records. Laughing and smiling were elicited by standard situations, such as peekaboo games or clapping hands. In the accompanying table are given the stimuli which can arouse the smiling and laughing of babies at different ages during the first year of life and the ages at which these responses first appear in Table XXVII.

Watson (1925) studied 85 situations causing laughter in children, sixteen months to three years of age. These children were observed constantly from waking to sleeping time. The seven most common experiences that elicited laughter were:

1. Being played with (playfully dressed, tickled, etc.):
2. Running, chasing, romping with other children.
3. Playing with toys (a ball was particularly effective).
4. Teasing other children.
5. Watching other children at play.
6. Making attempts which resulted in adjustment (e.g. getting parts of toys or apparatus to fit together or work).
7. Making sounds, more or less musical, at the piano, with a mouth organ, singing, pounding, etc. (Quoted by permission.)

Many situations, Watson reports, may call out crying instead of laughing, depending on how they are handled.

Tickling is also a source of laughter. The areas most responsive to tickling are those which are generally guarded against touch. The stimulus must come as a surprise, as is shown by the fact that the baby cannot tickle himself. If a child is tickled by a stranger, the response will probably be anger and tears. If, on the other hand, the tickling is by a person friendly to the child and in a playful attitude, the response is one of laughter.

In general, then, it is apparent that the laughter of young children is of two kinds: the laughter of general *well-being* and the laughter of *amusement* at comical situations in which the incongruous plays an important role. Any unusual sounds, funny sights, unfamiliar combinations, sudden appearances or disappearances of a person or toy, the "bopeep" game, and the jack-in-the-box, are sources of much childish laughter. Other situations which give rise to laughter are unexpected noises, grotesque faces and figures, slight calamities, as bumping into people, verbal play, such as punning, jokes, practical jokes, and imitating others, especially their speech and gait.

As children grow older, similar stimuli arouse the pleasant emotions as in the younger ages. Physical well-being, incongruous situations, play on words, slight calamities, and sudden or unexpected noises never fail to call forth a smile or laugh. In addition to these, the older child responds with laughter to any situation in which he feels superior, especially those which offer an opportunity for him to achieve success.

Release from the strain of pent-up emotions, such as anger or fear, and general physical well-being serve to call forth the pleasant emotions. These emotions are, for the most part, more pronounced when the individual is with the group than when alone.

Responses in Joy.—The joyful emotions are always accompanied by smiling or laughing and a generally relaxed state of the entire body. This contrasts markedly with the tenseness that occurs in the unpleasant emotions of fear, anger, and jealousy.

A detailed study of the characteristic expressions of smiling and laughing in little children made by Washburn (1929) showed that smiling changed greatly as the baby grew older. At the age of twelve weeks, smiling was expressed by a round, open mouth, twitching of the lips and other facial muscles, together with a protrusion of the chin and the sounds "ah-ah." At the age of thirty-two weeks, the mouth opened, thus raising the cheeks; the tongue protruded; the gums were exposed; the eyes were half closed, causing wrinkles at the outer corners; the arms, hands, and legs were waved around; and jargonlike sounds, together with babbles, formed the vocalization. At one year, a great individualization in the smile of different babies appeared.

Laughing proved to be much more stereotyped in its form than was smiling and did not vary to any appreciable extent during the first year of life. The mouth in laughter was found generally to be widely opened and round in shape; the tongue rarely protruded from the mouth but was generally flat on the bottom of the mouth cavity. Even though the mouth was wide open, the gums were little exposed and lower and upper teeth displayed by only one of the babies studied. The eyes displayed increased brightness and were generally almost closed, especially in the last quarter of the first year of life. The cheeks were drawn down by the lower jaw and thus gave a leveled appearance to the face. Only twice was flushing of the cheeks recorded. Little activity in the nose was recorded, with only an occasional wrinkling at the bridge apparent. The chin protruded slightly, and the head was tilted backward, especially from the ages of sixteen to thirty-two weeks.

After laughter, the hands and arms were usually active. During laughter, however, the arms were most often relaxed at the side of the body or held straight outward. The same was true of the legs. The trunk, instead of bending forward as in the case of adults, remained relatively stationary. Respiratory changes were more marked than in smiling and were observed by pulsations of the abdomen.

5. AFFECTION ✓

Affection is an emotional reaction directed toward a person or thing. It is conditioned or built up as a result of pleasant experiences on the part

of the child. The little child learns to have affection for those who play with him, who take care of his bodily needs, and who, in general, are responsible for giving him pleasure and satisfaction. Affection is not an innate emotional response directed toward parents, grandparents, or others with whom the child has a blood tie. His affection for his relatives depends, as it does in the case of those who have no relationship whatsoever to him, upon the way they treat him and whether or not his associations with them have been of a pleasurable sort.

The gradual growth of the sex organs of the child from birth until puberty, when the sex organs reach their mature size and function, results in an increase in sex feeling which is directed toward the individual for whom the child had developed an emotional attachment. Thus, the simple childish affections evolve into the love sentiments that play so important a role in the life of the adolescent. The development of the love sentiments will be discussed in the chapter on Sex Development.

Stimuli to Affection.—Not only human beings but animals and inanimate objects, especially toys, serve as stimuli to call forth expressions of affection on the part of the little child. After the first year of life, the child discriminates little between animate and inanimate stimuli in the demonstration of affection. In fact, the young child's affection for a favorite toy or a family pet is often as pronounced as it is for a member of the family.

Within the family group, the child's affection for the different members occurs in varying degrees, depending largely upon the child's association with them. In the case of brothers and sisters, the affection is largely dependent upon the way they have treated the child. Affection for the parents also depends upon associations.

• Simpson (1935), in a study of parent preferences of young children five to nine years old, found more mother than father preferences. As the children grew older, there was an increase in mother preference and a decrease in father preference. This he explained by the fact that the mother is a more constant companion to the children than the father and that the father becomes, as a rule, a stricter disciplinarian as the child grows older. Simpson also found that after children are six years old, the fathers play less with them, punish them more, and give them fewer gifts. Thus, a change in the child's attitude toward the father may be caused largely by a change in the father's conduct. This is borne out by the children's statement to the effect that they liked best the parent who catered to their material wants, expressed affection for them, played most with them, and punished them least.

Affectionate Responses.—Childish affection expresses itself by hugging, patting, and kissing the loved object or person. The toys of which the child is fond are hugged and patted until they are literally

hugged to pieces. Kissing is a less frequent expression of affection in young children than hugging and patting but, as the child approaches the adolescent years, his affection is more and more expressed by wanting to kiss or actually kissing the person for whom he has a feeling of deep affection. A younger child's affectionate response to an older sibling is illustrated in Fig. 37.



FIG. 37.—Affection in young children. (From L. H. Meek, *Your child's development and guidance told in pictures*, Lippincott, 1940.)

At every age during the childhood and adolescent years, there is a desire to be with the loved person and to assist him in whatever he is doing. During adolescence, there is a marked desire to imitate the loved one in every possible way. Typically, the little child takes with him, wherever he goes, a toy for which he has an affectionate feeling, and he continues to rank it among his favorites even after it is old and shabby.

Affectionate responses in sisters, McFarland (1938) noted, include physical advances, such as patting, hugging, and kissing; verbal expressions, as love names or endearing statements; and attempts on the part of the older sisters to protect and help the younger sisters. The verbal expressions of affection were used mostly by the older sisters who had the superior position of an adult in their relationships toward their sisters.

Among nursery-school children, Murphy (1937) found the freest and most frequent expressions of affection occurred in the lower economic group. Among all types of children, however, spontaneous expressions of affection occur occasionally when children are with their playmates.

6. CURIOSITY

Stimulus to Curiosity.—Interest in the environment is limited during the first two or three months of life unless a strong stimulus is directed toward the baby. After that, anything *new* or *unusual*, which is recognized as such by the child, is certain to arouse the curiosity of the child. This in turn motivates him to explore until his curiosity has been satisfied.

Responses in Curiosity.—Curiosity is, in the case of young babies, expressed by tensing the face muscles, opening the mouth, stretching out the tongue, and wrinkling the forehead. At first, a slight startle may accompany curiosity, suggesting that the baby is frightened by new and unfamiliar objects. Soon, however, as he explores the object, the startled expression gives way to pleasure and laughter.

By the second half of the first year, bodily expressions of interest occur in the form of stretching the body, leaning toward the object, and grasping for it. As soon as the baby gets hold of the object, he begins a more thorough exploration by handling, pulling, sucking, shaking, and rattling it. Thus, the different sense organs are stimulated, and the baby discovers meanings through the use of these channels. This sensory-exploration-motor-manipulation period extends from the middle of the first year to the third or fourth year. During that time, the little child breaks and harms many objects, not intentionally, but because his relatively poor muscle coordination makes him clumsy and awkward.

Later Responses.—Social pressure, in the form of admonitions and punishment, acts as a check on the satisfaction of curiosity through direct exploration. Therefore, as soon as the child is old enough to put words together in sentences, he asks *questions* about the things that arouse his curiosity. The "questioning age" begins around the third year and reaches its peak at approximately the sixth year, when the child enters school and begins his formal education. How important a role questioning plays in the satisfaction of the child's curiosity depends to a large extent upon the satisfaction the child receives from those whom he questions.

When the child is old enough to read without giving too much attention to the mechanics of reading, he discovers that he can satisfy his curiosity through *reading* about things for which he has not been able to find an adequate solution in direct exploration or questioning. Motivated by the desire to explore, the child of eight or nine years of age devotes much of his leisure time to reading. Through the adolescent

years, when curiosity about sex and other matters which present new problems to the adolescent arises, reading proves to be a very satisfactory supplement to—or substitute for—the methods of exploration used in earlier years.

SENTIMENTS

Sentiments are *complex emotional patterns* with an intellectual core or foundation. They are attached to persons, things, or situations and are developed as a result of the child's experiences. They are thus learned reactions and are generally weaker than the emotions already described.

Social Sentiments.—Sentiments begin to develop early in the school life of the child. The first sentiments to make their appearance are the *social sentiments*, or sentiments built up around the individuals or situations belonging to the gang life of the child. Such sentiments as group loyalty or revenge, patriotism, school spirit, and pride in one's friends are not only present during childhood but they play a very important role in the child's emotional life.

Aesthetic Sentiments.—During adolescence, the finer, *aesthetic sentiments* make their appearance. The social sentiments weaken at this age and are, to a large extent, replaced by the sentiments related to the love life and religious interests of the adolescent. Family pride, love for friends of the same or opposite sex, love of art, literature, or music, and religious fervor are characteristic sentiments of the adolescent years. The intellectual core of these sentiments is stronger and the emotional accompaniment weaker than that of the social sentiments. They are, however, more like the sentiments of adult life than of the early childhood or school years.

FACTORS INFLUENCING EMOTIONALITY

In every child, as in every adult, the state of emotionality varies from time to time, depending on such factors as health, time of day, and environmental influences. Any attempt to control the emotionality of the child must take into consideration these factors because emotional control can be brought about best by eliminating the factors which act as predisposing causes. The most important of the factors predisposing the child to emotionality are the following:

1. **Fatigue.**—When the child becomes tired, owing to too little rest, too much excitement, inadequate food for his needs, or other less common causes, he is predisposed to irritability and temper tantrums. This holds true for every age during the childhood years but is especially serious in the early years of life when the child does not recognize fatigue as such and continues to play actively instead of resting at the time when he really needs to rest. Gates (1926) studied the causes of anger in

women college students and found that by far the largest number of cases of anger occurred when the girls were tired.

2. Poor Health.—When the child is in poor health due to malnutrition, digestive disturbances, diseased tonsils and adenoids, defective eyes, poor teeth, or colds, he is predisposed to emotionality, just as in the case of fatigue. Stratton (1926), in order to discover the effect of disease on emotionality, studied fear and anger in more than 1,000 college students. He found that in the case of men students, the relationship between disease and anger was more pronounced than in women. Men, with the history of disease behind them, seem to be in a state of readiness for more intense anger than women with a similar history. The type of disease affected the two sexes differently. Influenza, for example, had little importance in the anger reactions of women but marked importance in the case of men. In both men and women, fear seemed to be little influenced by a history of disease. The effect of physical conditions on the arousing of anger was studied by Gates (1926). Three times as many students reported that poor physical condition, such as fatigue, sleepiness, hunger, or colds, was present when anger occurred than reported good condition at the time.

3. Time of Day.—Because the child becomes more fatigued at certain times of the day than at others, it is not surprising to find that these times are accompanied by pronounced emotional disturbances. In babies and young children, the periods preceding the scheduled eating and nap times are the ones when emotionality is apt to be at its height. If the child's schedule is interfered with, and eating or nap time delayed, the period preceding it is generally one of pronounced fussiness and irritability.

In Gates's (1926) study of anger in Barnard College students, it was found that the high point in the occurrence of anger during the day was reached just before dinner. The afternoon was marked by more emotional disturbances than either the morning or the evening. The hour just before meals had an average of 20.5 emotional outbursts, contrasted with 6.0 outbursts in the hour immediately following meals.

4. Order of Birth.—First-born children are, proverbially at least, "spoiled." It is therefore not surprising if the oldest child of a family is more emotional than the latter-born children. The first-born has learned from experience that the use of the emotions is a quick and easy way to get what he wants, and, as a result, the child develops the habit of giving way to emotional outbursts. Similarly, the youngest child of a family, if he has been "babied" by parents and older brothers and sisters, develops habits of emotional reactions as the easiest method of dominating the social situation.

Stratton (1927) reports a very low probability that difference in fear exists between the first- and the latter-born members of a family. In

the case of anger, on the other hand, first-borns were found to have on the average an anger score distinctly larger than those who were born later. The reason, according to Stratton, that emotionality among the first-born is greater than among the latter born is traceable to the difference in relationship to the parents rather than to other children in the family.

5. Environment.—The last and one of the most important of the factors influencing the emotionality of the child is his social environment. The way in which children are handled by parents and nurses, the amount of excitement their environment affords, the number of restraints placed upon their activities, the type of discipline used to control their behavior, and the ease with which they can get what they want from others, all contribute to emotionality. In addition to this, the child can develop habits of emotionality from being associated with people, whether adults or children, who are themselves highly emotional. Contact with an emotional person for several hours will tend to increase the child's emotionality, while contact with a calm, unemotional person results in quiet, unemotional behavior.

CHAPTER IX

SOCIAL DEVELOPMENT

Influence of the Social Group.—Every child, like every adult, is dependent upon other people for his existence. This dependence is complete at birth and during the early years of babyhood. As the child becomes older, he becomes less dependent upon the social group. Nevertheless, he still needs the group and cannot live without contacts with others. During each succeeding year his relations with others become more complex, and he must come in contact with more people, as well as with people of different types. Most of these people do not have the personal interest in him that his parents have, and consequently they do not try to make his adjustments to them easy, as is usually done at home.

Not only is the child dependent upon the social group but, of even more importance, the social group upon which he depends determines to a large extent what type of individual he will be. Because he is plastic, both physically and mentally, his development can be influenced and molded into a pattern determined by the members of the group with whom he is most often associated. At no age is he free from the influence exerted by his associates. This influence is especially pronounced during the early years of life, because this is the time of greatest plasticity.

Meaning of "Social" Development.—*Social development* means the attaining of maturity of social relationships. This involves the development of new types of behavior, a change in interests, and the choice of new types of friends. The *social* individual is one who not only wants to be with others but who wants to do things with them. In contrast to the social individual is the *gregarious* one who craves the presence of others, is lonely when away from them, but whose desire for companionship is satisfied when he is in the presence of those of his own kind, regardless of contacts of any sort. Gregarious behavior is characteristic of most animals of the lower levels, while social behavior is characteristic of higher animals and of human beings.

No child is born social, in the sense that he can get along well with others. He must learn to make adjustments to others, and this ability can be acquired only as a result of opportunities to be with all types of individuals, especially during the years when socialization is an important phase of the child's development. Like all development, this requires

planning and guidance on the part of those who are in charge of the child if the most desirable results are to be achieved. Because the social group exerts so marked an influence on the personality of the child, it is obvious that the members of the social groups should be selected because of the desirable influence they can exert over the child. This guidance must come from adults, because the child is too young and inexperienced to be able to guide his own development in the most advantageous way.

THE PATTERN OF SOCIAL DEVELOPMENT

Social development follows a pattern, in an orderly sequence, not only in the type of social behavior displayed at each age but also in the type

TABLE XXVIII.—GENETIC DEVELOPMENT OF SOCIAL BEHAVIOR

Behavior items	Age, weeks															
	4	6	8	12	16	20	24	28	32	36	40	44	48	52	56	
Responds to smiling and talking.....	8	62	63													
Visually pursues moving person.....	12	69	74													
Knows mother.....	3	21	39	81	92											
Shoers at strangers.....	0	3	4	35	56											
Turns head on sound of voice.....	0	3	26	42	50	100										
Accepts strangers.....	100	100	100	100	80	61	52	59	41	39	39	26	18	18	14	
Withdraws from strangers.....	0	0	0	0	19	8	24	16	47	42	19	48	44	30	9	
Adjusts to words.....					0	8	12	16	47	68	75	94	82	89	73	
Responds to "bye-bye".....					0	3	3	3	13	35	53	65	38	59	27	
Adjusts to commands.....					0	0	0	3	22	23	31	55	56	73	50	
Responds to inhibitory words.....					0	0	0	3	25	23	28	45	44	52	23	
Responds to "So big".....					0	0	0	0	6	7	8	26	18	34		
Elicits attention.....					0	0	0	0	9	16	14	26	27	53	50	
Plays patacake.....					0	0	3	6	19	23	25	42	27	50	9	
Plays peekaboo.....					0	6	6	0	9	13	11	13	9	25	9	

Source: GEsELL, A., and THOMPSON, H. *Infant behavior, its genesis and growth*. New York: McGraw-Hill, 1934, p. 258. Quoted by permission.

of companions selected. This means that normally every child should pass through certain phases of becoming socialized at approximately the same age as other children pass through the same phases. As is true of other types of development, bright children are accelerated in this development, while dull children are retarded in their progress toward social maturity. Knowing what the pattern of social development is, one can readily predict that at a certain age the child will be timid in the presence of strangers; at another age, he will crave the companionship of individuals of his own age and sex; while at still another age, his interests will be centered on members of the opposite sex.

Early Sequence.—Studies of large groups of nursery-school children have revealed marked age levels of social adjustment. Blatz and Bott (1927) noted that, while the two-year-old is solitary in his play, nevertheless he is influenced by older children to the extent that he imitates their behavior both in play and in his conduct. The three-year-old plays with other children and shows the rudiments of team play with definite cooperation and a differentiation of function in the play.

Gesell and Thompson (1934) studied social behavior in the first year by testing 107 babies, seven at each age level from the fourth to the fifty-sixth week of life. In Table XXVIII are given the percentage of responses at each age level.

The two-year-olds (2:0 to 2:6 years) studied by Hattwick and Sanders (1938) were found to be unsocial and lacked social interest, owing largely to their lack of physical, motor, and emotional control; 2½-year olds (2:6 to 3:0 years) refused to share toys with others, grabbed toys from other children, ignored requests, and refused to comply. The four-year-olds, on the other hand, showed for the first time that they were influenced by the social group. They were conscious of others and of their opinions; they looked for praise, criticized others, and tried to gain attention by "showing off."

Expectations of Social Behavior.—Because the pattern of social development is so similar for all children, the people about him have come to expect certain behavior from the child at certain ages. Murphy, Murphy, and Newcomb (1937) have listed the following sequence of responses which the growing boy is expected to display:

1. He is expected to be cute and beautiful, the idol of the family, from birth to two or three.
2. He is expected to keep out from under foot and give the adults a chance to take care of the new baby (this experience may come at any time from two to six in most families).
3. He is expected to sit still in school and learn to read and do numbers (beginning elementary school).
4. By his own age group he is expected to prove that he is male and is independent of the grown-ups (six to twelve).
5. The girls expect him to learn to dance, and look nice, and drive a car (early adolescence).
6. The school expects him to throw all his energies into winning for the —— High School. His parents expect him to get the best marks.
7. He is expected to find a job, either to support himself or to contribute to the expenses of college or vocational school in order to prepare for a job later. (Quoted by permission.)

PRESOCIAL BEHAVIOR

At birth, the baby is nongregarious, as may be seen in his complete lack of interest in people. So long as his bodily needs are taken care of,

he does not crave or even miss the companionship of others. He does not distinguish between people and inanimate objects. He merely responds to stimuli in his environment.

Karl Bühler (1930), reporting an experimental study of babies in the first year of life, maintains that much which is popularly regarded as social behavior is in reality uninfluenced by social contacts. The crying baby can be quieted by lifting up the bed on which he is lying without disturbing him or without making any sounds whatsoever. Change in position or in auditory stimulus can be responsible for the crying of the baby and not the presence of human beings. Likewise, he demonstrated that the baby could be quieted when caressed by a hot-water bottle or a soft cushion just as easily as when caressed by the mother.

During the first two months of life, the baby's reactions to external stimuli come only when the stimuli are intense, as in the case of loud noises, bright lights, or strong touch stimuli. He does not even distinguish between the human voice and other noises. In fact, he responds more often to noises than to the human voice because of the greater intensity of the former. He, likewise, gives similar responses when touched by a person or an object.

Soon, however, he learns to distinguish between people and inanimate objects because of the prominent role people play in his life. From the beginning of the third month, gregarious behavior supplants non-gregarious. The baby shows contentment when in the presence of others but is discontented, unhappy, and "fussy" when by himself. At this time, also, there is a beginning of true social behavior.

BEGINNINGS OF SOCIAL BEHAVIOR

Social behavior begins when the baby first distinguishes between *persons* and *objects*. Just when this occurs is difficult to determine exactly and must be judged in terms of the overt responses of the baby. Because the environment of little babies is, on the whole, somewhat similar in major features, the beginnings of social behavior vary less from one baby to another than later on, when individual differences in environment are of a more pronounced type. For that reason, the pattern of social behavior for the first two years of the child's life is similar, in most respects, to that of other children of the same age and intellectual level.

Reactions to Adults.—The first social responses of the baby are to *adults*. This is due to the fact that normally the baby's first social contacts are with an adult. Studies of groups of babies by Bridges (1931), Bühler (1930), Gesell (1940), Hetzer and Tudor-Hart (1927), Jones (1926), Shirley (1933), Washburn (1932), and others have shown

what are the characteristic forms of social behavior that appear in the early months of babyhood. Positive social behavior predominates at this age, as is seen in the following pattern of responses.

By the age of one month, the baby will respond to the human voice by sucking movements. During the second month, the baby will stop crying as soon as he is picked up (Bühler, 1930). The baby also turns when he hears a human voice. By the end of the second month, social smiling, or smiling in response to the smile of an adult or a clucking sound, appears. Jones (1926) observed social smiling first in the babies she studied at thirty-nine days, in 50 per cent of the babies by the 68th day, and in 100 per cent of them by the ninetieth day. Hetzer and Tudor-Hart (1927) noted the reactions of young babies to a number of auditory stimuli, including angry voice, singing, whistle, knocking, handclapping, and the noise of a spoon. They found that at two months of age, babies smiled more in response to the voice and exhibited greater acuity for this sound than for other stimuli. Washburn (1932) reports that smiling in response to social stimulation, such as peekaboo games, appears first around the eighth week, while laughing makes its first appearance at about the twelfth week.

During the third month, babies stop crying when talked to, but they can also be quieted when their attention is diverted by a rattle or some other mechanical device. At this age, they show a beginning of interest in people by crying when a person leaves them. They likewise show displeasure when losing the glance of an adult. The baby soon learns that crying brings attention and thus, in a few weeks' time, unless definite steps are taken to prevent it, he dominates the household by this method. At this age, the baby shows by his behavior that he recognizes the mother or nurse.

In the fourth month, the baby makes anticipatory adjustments to being lifted, shows selective attention to the human face, looks in the direction of the person who leaves him, smiles in response to the person who speaks to him, shows delight in personal attention, and laughs when being played with. From the fifth or sixth month, the baby reacts differently to smiling and scolding and distinguishes between friendly and angry voices. Bühler and Hetzer (1928) found no differential responses to kind and scolding voices, smiling and angry facial expressions, or angry and threatening gestures, until the baby was five to seven months old. Then the babies studied showed an understanding of the diverse expressions, by crying in response to unfriendly expressions and smiling to friendly ones. At this age, babies recognize familiar persons with a smile, laugh in peekaboo play, imitate simple acts, such as the clapping of hands and waving of arms, resent opposition or interference, and show for the first time definite expressions of fear of strangers.

By the eighth or ninth month, the baby attempts to imitate the speech of others, by repeating syllables heard, and likewise imitates simple acts and gestures observed in others. At twelve months, he can refrain from doing things in response to "no-no" or some other form of request, and at the same age he shows definite fear and dislike of strangers by crying or drawing away when a stranger approaches. Negativism, in the form of contrariness and stubborn resistance to the requests or demands of adults, is a normal reaction at the age of eighteen months. At two years, the child can cooperate with adults in a number of routine performances.

Reactions to Other Babies.—Social reactions to individuals of the same age as the baby lag behind the social reactions to adults. Observations by Bridges (1933), and Maudry and Nekula (1939) have revealed that the first indication that a baby perceives another occurs between the ages of four and five months, when the baby smiles at another child or shows attentive interest in the cry of another. From six to eight months, lack of interest in other children leads to few contacts with them. Friendly contacts consist of looking at, smiling at, and reaching out and grasping another child, while unfriendly contacts consist of blind attempts to get hold of material from another child, often resulting in impersonal fights. Between nine and thirteen months, the baby explores other babies by pulling their hair or clothes, imitates the behavior and vocalization of others, and shows for the first time cooperation and social use of material. Fighting becomes intense and personal. When a toy is taken away by another, the baby becomes angry, fights, and cries.

Social reactions toward other children during the second year develop rapidly. From the thirteenth to the eighteenth month, the young child's interest shifts from play materials to the playmate. There is a decrease in fighting for toys and an increase in cooperative use of them. When a toy is taken away, the child is apt to fight by pulling hair or biting. He smiles and laughs in imitation of another child. During the last half of the second year, the child is definitely interested in play with children, and play materials are now regarded as a means of establishing social relationships. The child cooperates with his playmate, modifies his behavior to adjust to his playmate's activity, and engages more frequently in games with other children. Even at this early age, young children are united as a group in their behavior on certain occasions, as when waiting for a nurse's signal before handling their spoons (Bridges, 1931).

Early Forms of Social Behavior.—As a result of contacts with others, certain forms of social behavior begin to develop at this age. In order to become a part of the social group, the baby *imitates* those about him, both adults and other babies. He first imitates facial expressions, such

as laughing and crying, around the third month, then gestures and movements, as waving bye-bye, shaking the head, or throwing a kiss, from the age of six months, and still later, around the twelfth month, he imitates the sounds heard in his environment, like "choo-choo," "tick-tock," "ding-dong," or the simple sounds in the speech of others. From this as a foundation, speech is built up. During the second year, when the baby learns to feed himself, dress himself, manipulate his toys, and, in general, act like those around him, it is through imitation that this behavior is possible.

By the fifth month, the baby begins to distinguish familiar people from strangers. This results in *timidity* and *shyness* in the presence of strangers, appearing first around the sixth month and generally pronounced from the ninth to twelfth months, the period commonly known as the "strange age." At this time, the baby reacts to strangers with a solemn stare, puckered lips, whimpering, and crying. He hides his head and clings to the person holding him. At the same time, he continues to be friendly with those whom he knows. Whenever, at this age, the baby is taken to a strange room or new surroundings, he will react with fear, just as he does when placed with strange people. Even a familiar person in an unfamiliar costume, the nurse in her street clothes instead of the familiar white uniform, will bring forth reactions of timidity on the baby's part.

Toward the end of the second year, there is another "strange age," similar to the one just described. How pronounced it will be depends largely upon the opportunities the baby has had to come in contact with different people and new environments. At this time, there is an ostrich-like desire to hide from strangers, shown by the common reaction of burying the head in the mother's lap, hiding behind a piece of furniture, shyness about accepting things from strangers, and refusal to speak, even to say "good morning." This self-conscious, shy behavior, Shirley (1933) found, is especially pronounced between sixty-six and eighty-six weeks of age.

Rivalry, especially in play with other children, appears during the second year. The baby tries to take the toys of others, not because he wants them but because it gives him pleasure to assert his superiority in this manner. This generally leads to crying on the part of the child who has been deprived of his toy. Rivalry also may be seen in the bid for attention and affection of an adult which, if not satisfied, leads to jealousy on the child's part. *Social cooperation*, which, like rivalry, is essential in social contacts, appears first in the baby's play with adults in peekaboo and similar games. Because the adult is willing to do the lion's share of giving and taking, cooperation is successful. But, with others of approximately the same age, the baby cannot cooperate for more

than a few minutes at a time, thus resulting in inability to play with other little children successfully at this age.

SOCIAL BEHAVIOR IN EARLY CHILDHOOD

In the preschool years of early childhood, from ages two to six years, children progress from being relatively unsocial to distinctly socialized individuals. Because this is the forerunner of the gang age, in which the beginnings of gang behavior make their appearance, it is generally known as the "pregang age." During this short period of time, the child learns to adapt himself to others and to cooperate in play activities in which several children are involved. He consequently is prepared for active participation in the gang when his school days begin.

Relations with Adults.—The young child not only spends less time with adults than he did when he was younger but he also derives less enjoyment from them. With each succeeding year, his interest in playmates of his own age increases, and with this comes a decrease in interest in adult associations. Observation of the play activities of young children showed Bott (1928) that talking was the most frequent form of social contact both among children and in their relationship with adults. When social relations were studied to discover in how many instances the child was active and in how many passive, it was found that the number of relations in which children were active was slightly larger, both in their relations with other children and with adults, than the number in which they were passive.

The attitude of young children toward adults has been studied by Bridges (1931) in nonexperimental situations involving nursery-school children. At the age of two years, the child is dependent, passive, and relies on adults for attention and assistance. By the age of $2\frac{1}{2}$ to 3 years, the child begins to resist adult influence and wants to be independent. He is therefore self-assertive and difficult to handle. After four or five years, however, he gradually becomes cooperative and friendly, seeking the approval and trying to avoid the disapproval of adults.

Relations with Other Children.—Before the age of two years, young children engage in solitary play. This is true even though they may play in the same room and with toys similar to those used by other children playing there. This is *parallel play*, in that there is no interaction taking place even though the activity is similar for all. The only contact with others consists of imitating them, watching them, or attempting to take away from them a toy which has attracted the child's attention. Two or three children may engage in parallel play at this age, but rarely more than that. Figure 38 shows characteristic parallel play. At this age, children relatively more often resist the social advances of other children than is true of the older ages (Beaver, 1932).

From the age of three or four years, due to increased ability to control the body, to handle objects, and to talk, there is an increase in social play. Little children now begin to play together, to talk to one another while they play, and to select from the children present those with whom they prefer to play. The size of the play group increases with age, from two members at three years to three or four members at six years. Even then, the group splits, and the children play in twos. Approximately two-thirds of the two-child groups are unisexual (Parten, 1932a). The most common behavior of these groups consists of watching each other,



FIG. 38. Parallel play. (From F. J. Brown, *The sociology of childhood*. Prentice-Hall, 1939.)

holding conversations, and making verbal suggestions (Updegraff and Herbst, 1933).

Parten's Study.—Parten (1932, 1933) studied the social participation of 42 children ranging in age from two to five years during 1-hour free-play periods in nursery school, when the children were allowed to play with any toys, with other children, or alone, as they wished. Parten used the method of repeated short samples and observed each child daily for one minute. To avoid errors of sampling, the hour was divided into 5-minute intervals, and observations were rotated so that each child was observed an equal number of times during the first 5 minutes, the second 5, the third 5, etc. He found the following forms of social participation:

1. *Unoccupied behavior*, in which the child watches anything of momentary interest and plays with his body if there is nothing exciting taking place.
2. *Onlooker behavior*, in which the child watches other children at play. The child may talk to the children at play or offer suggestions but he himself does not enter into the play.

3. *Solitary independent play*, in which the child plays alone and independently with toys different from those of other children and without reference to what they are doing.

4. *Parallel activity*, in which the child plays independently but with toys like those used by the other children. He plays beside other children rather than with them.

5. *Associative play*, in which the child plays with others. In this play, all other children in the group engage in similar if not identical activity.

6. *Cooperative or organization supplementary play*, in which the child plays in a group organized to make some material product or to play some game. The group is controlled by one or two members who direct the activity of the others.

Only the youngest children of the group, those from two to three years of age, were found to engage in unoccupied behavior. At $2\frac{1}{2}$ years, solitary play occurred more frequently than at any other age level. Likewise, onlookers were more often found in the groups ranging in age from $2\frac{1}{2}$ to 3 years. This, Parten explained, seemed to be caused by the fact that children of this age had overcome the initial shyness resulting from being placed with strange children and had begun to take an interest in the activity of the group though not actually participating in it.

The most common of all of these forms of participation in early childhood was parallel play, observed most often among the group of two-year-olds. Cooperative or organized supplementary activity was not frequently found up to the age of three years, owing to the child's limited speech which makes cooperative play difficult or impossible.

Parten reports that there is a decided decline in the importance of solitary play as well as of onlooker behavior after the age of $2\frac{1}{2}$ years. If interested in an activity, children engage in it rather than watch it. Assertive group play, and also organized supplementary or cooperative activity, showed a marked increase beginning with the third year and accounts for the popularity of such games as playing house or playing store.

Forms of Social Behavior.—As a result of early social contacts with children and with adults, the child begins to develop types of social behavior which will prove to be invaluable to him during the gang age, as well as in mature life. Because, as a baby, he was helpless and required constant care, every young child is self-centered. Play with other children soon teaches him to adjust himself to group life, to give and take, and to share his possessions with his playmates. Through imitation of the actions, words, and emotions of others, the child tries to make himself like his playmates and to conform to a pattern approved by the group to which he belongs. The child is highly sensitive to social praise and blame, whether it comes from adults or from other children. He therefore tries to regulate his conduct to win praise and avoid disapproval.

Negativism.—Negativism is a form of behavior in which the child shows resistance to adult authority. It is commonly called "stubborn-

ness" or "contrariness," and it makes young children difficult to manage. Resistant behavior is first noticeable at about eighteen months of age and reaches a peak at three years. It is so common at this age that it may be regarded as normal. After the fourth year, there is usually a decline in negativism due partly to social influences, partly to the fact that the child learns that it is to his advantage to comply, and partly to the fact that the adults in his environment have learned to respect the child's desires.

Negativism is a product of social situations. It occurs as a result of the aggressive use of discipline or an intolerant attitude toward normal childish behavior on the part of adults. It generally appears in connection with the established home routine, when the child refuses to comply with the adult's requests that he carry out a certain activity at a scheduled time, such as coming to the table for supper when his plate is placed on the table. It also appears in situations involving strangers, whether the situation be a social call or an intelligence test. Rust (1931) noted that among three-year-olds a resistant attitude appeared when the intelligence test was first presented. It was especially pronounced in the more difficult tests or those involving verbal responses.

Rivalry.—Rivalry is characterized by a desire to excel, or to outdo others, and is always stimulated by another person. It is therefore a form of social behavior. Among older children, both in school and in play, rivalry is an important factor in determining the form the activity will take. It begins to develop during this pregame age. In an experiment in which children inserted pegs in a board, Leuba (1933) found no indication of rivalry in the two-year-olds. There was no reaction to the other child engaged in the same task except to look at him occasionally. A year later, rivalry made its first appearance, but it was eclipsed by other social attitudes, especially imitation. The children were found to do less work in pairs than when alone, because the other child proved to be a source of distraction. At five years of age, on the other hand, rivalry proved to be a dominant attitude when the children worked together, and their output increased as a result of this.

Studies of kindergarten children have convinced Greenberg (1932) that the competitive spirit, which leads to rivalry with other children, develops according to a pattern in the child's relations to play materials. In the 2- to 3-year-old group, there was no competition, only interest in the play materials. Some competition appeared in the 3- to 4-year-old group, owing to the fact that by that age the child had a better understanding of excelling and was interested in excelling. At four years, competition made its appearance, and the child showed a desire to excel. At least 90 per cent of the six-year-olds studied by Greenberg had a well-developed competitive spirit.

Quarreling.—In spite of the young child's desire to play with others, there is much quarreling. This is due primarily to the fact that children have not yet learned to cooperate satisfactorily in their play, as may be seen in Fig. 39. Quarreling takes the form of destruction of the other child's work, taking away the toys the other child is playing with, screaming, crying, and actual bodily attack, such as hitting or pushing. When



FIG. 39.—Quarreling during play is very common in childhood. (From L. H. Meek, *Your child's development and guidance told in pictures*. Lippincott, 1940.)

a new toy is presented, quarreling is sure to arise, unless there are enough toys so that each child may have one. Conflicts among children last only a short time, and when they are over, the children are as friendly as before the quarrel started. Quarrels and friendships go hand in hand. Even the best of friends among young children quarrel.

Studies of quarreling among preschool children have revealed that many factors influence the frequency and severity of the quarreling. In young children, conflicts over property are greater than conflicts in which an attack on the child's person is the starting point (Murphy, 1937).

Green (1933a) found that the type of activity engaged in was a factor of importance in the quarrels. In the table below are given the percentages of quarrels accompanying different types of activity and the percentages of quarrels when the activity involved play with companions.

TABLE XXIX.—TYPES OF ACTIVITY AS A FACTOR IN FRIENDSHIPS AND QUARRELS

Activities	Percentage with companions	Percentage involving quarrels	Quarrels as percentage of play with companions
1. Dramatic play.....	93	20	21.6
2. Bodily activity with apparatus.....	64.5	12.95	20.1
3. Destruction and meddling.....	63.5	15.8	25
4. Sand play.....	62.5	23.6	37.6
5. Quiet intellectual pursuits.....	61.5	12.5	20.4
6. Construction work.....	60.5	20.2	33.6
7. Helping.....	55.5	11.1	20
8. Bodily activity without apparatus....	48.5	9.5	19.5
9. Play with toys.....	47.5	15.6	32.8
10. Fine manipulation.....	42.3	9.8	23.3
11. Inactive pursuits.....	33	10.8	32.8

Source: GREEN, E. H. Group play and quarreling among preschool children. *Child Developm.*, 1933, 4, 306.

From the above table it may be seen that the activity that called forth the most quarrels in relation to the number of times it was participated in was sand play. Quarrels arose nearly one-fourth of the time. Constructive work, play with toys, and destructive and meddlesome activities also led to many quarrels. All of these activities involve play with companions. The least amount of quarreling, on the other hand, occurred in activities in which companions played a relatively unimportant role, as bodily activity with apparatus or quiet intellectual pursuits.

The three-year-olds are the most quarrelsome of the preschool groups. As children grow older, improved social adjustments result in a decrease in quarreling (Jersild and Fite, 1939). Boys, for the most part, quarrel more than girls, start more quarrels, and retaliate more than girls do. They likewise use more physical force while girls use more verbal arguments (Green, 1933a). The greatest amount of quarreling occurs in the boy-boy groups, next in the boy-girl groups, and least in the girl-girl groups. The median duration of quarrels in the preschool years is 30 seconds, and there is approximately one quarrel every five minutes. These quarrels are transitory in character and are rarely accompanied by severe or prolonged aftereffects (Jersild and Markey, 1935).

Teasing and Bullying.—Teasing and bullying are aggressive forms of behavior closely related to quarreling. Teasing consists of a mental

attack on another in an attempt to "get his goat" and thus arouse an angry response on the part of the individual attacked. This may consist of calling others nicknames that arouse their anger or putting emphasis on their physical or mental weaknesses. In bullying, on the other hand, the attacker attempts to inflict physical pain on others because of the pleasure he derives from watching their discomfort and their attempts to retaliate. Typical forms of bullying consist of pulling hair or clothes of others, pinching, poking, pushing, sticking pins into others, or putting thumbtacks on chairs just as others are ready to sit down.

Older or larger children more often engage in these aggressive forms of behavior than do small or physically weak children. The younger children in the home or in the school class are generally made the "butts" of the older children. Not all children, however, engage in these forms of aggressiveness. Boys tease and bully more, on the average, than do girls, and children who show feelings of inferiority or insecurity engage more in these activities than do the socially better adjusted children. Within a family, the older children are more apt to tease and bully than are the younger ones.

Cooperation.—The young child, at two or three years of age, is self-centered and quarrelsome. It is therefore difficult to get him to play in a cooperative manner with other children. Should his activity be with adults, it is the adult who does the major part of giving, while the child takes what he wants with little attempt to reciprocate. Most of the play with other children is parallel play, with only occasional interchanges. By the end of the third or fourth year, there is an increase in cooperative play and group activities are longer in duration. The more opportunity the little child has to be with other children, the sooner he will learn to cooperate with them.

Sympathy.—Sympathy is a form of social behavior in which a child is affected by the emotional states that another individual, whether it be adult or child, experiences. An extensive study of sympathetic behavior in nursery-school children made by Murphy (1937) has revealed some important facts about this form of social behavior in young children. Children of two and three years of age, she found, did not as a rule respond sympathetically to black and blue wounds, swellings, lumps and minor flesh distortions which might, to an adult, suggest discomfort or illness, Red Ridinghood being eaten up by the wolf, pictures of accidents, funerals, being crippled, or carrying crutches. The three-year-olds generally, though not universally, responded to people whose distress involved bandages, blindness, injuries colored with mercurochrome or iodine, red swellings, scars or scratches; to deprivation of toys, food, or mother; to physical dilemma, such as being caught in a play pen or bicycle; to an interference with activity of child having to stay in bed;

to frustration in activity; to attack by another child; to incompetence to do a job undertaken; to an accident, such as a fall; or to crying.

Sympathetic responses on the part of young children, Murphy noted, consisted of helping others; removing or attempting to remove the cause of distress; comforting others by pets, pats, hugs, and kisses; punishing the cause of distress; protecting and defending the person in distress; warning, or telling an adult or other child about an individual in distress; asking questions to find the cause of distress; and suggesting or effecting solutions. Occasionally unsympathetic responses were observed, and these consisted of laughing at the person in distress, using the situation to play his own role, usually a dominating one, attacking a child in distress, or merely staring instead of sympathizing.

Marked individual differences in sympathetic behavior appear. It increases with both mental age and chronological age. At two or three years of age, no sex differences occur, though at later ages girls are generally more sympathetic than boys. That sympathy in young children is dependent to a large extent upon the child's ability to comprehend the situation was demonstrated by Murphy in framed situations or informal experiments, designed to test the child's sympathetic responses. The child's response was influenced to a large extent by the meaning of the situation to him, in relation to his previous experience.

Social Approval.—The desire to be noticed by others, especially if the recognition be favorable, is a source of keen pleasure to a child even before he is two years old. With each succeeding year, the child becomes increasingly anxious to win the approval of others, first that of adults and later that of individuals of his own age. Absence of social approval, on the other hand, not only causes the child to be unhappy but often drives him to behave in a socially unacceptable way which, he has discovered from experience, invariably brings forth the attention of others, even though it is usually not accompanied by their approval.

Summary.—From the survey of social behavior in young children, presented above, it is apparent that most of the important types of social behavior necessary to adjustment to others begin to develop at this time. Even though they are not well enough developed to enable the child to get along successfully with others at all times, there is nevertheless an important beginning which will serve as the foundation for further development during the gang age.

The number of contacts the child has with other children is an important factor in determining how far this development will progress at this early age. Jersild and Fite (1939) noted that kindergarten children who had previous nursery-school experience entered into a decidedly larger number of social contacts than those who had never before attended nursery schools. By the spring term, however, the "new" children had

made marked progress in developing social behavior, shown by the fact that they made as many social contacts as the children who had attended nursery school during the preceding year.

THE GANG AGE

After the child has entered school and has come in contact with other children, he loses interest in playing around the house, alone, or with one or two companions. He likewise now considers it a bore and not a treat to accompany his parents on picnics, parties, or family gatherings. At the same time, interest in individual games gives way to group games, and play without companions loses its charm. The child has entered the "gang age," an age when social consciousness develops very rapidly.

The child's gang is the result of a spontaneous effort on the part of the child to create a society adequate to meet his needs. It is a substitute for what adult society fails to give and, at the same time, it offers relief from adult supervision. Through gang influences, the child receives important training in social behavior that could not be obtained with comparable success under conditions imposed by adult society. There is an awakening of social consciousness at this time which is fundamental to all social behavior.

Studies of the gang age by Block (1910), Furfey (1926), Hartson (1911), Puffer (1905), Thrasher (1927), and others have revealed important facts about the gang and its influence upon the social development of the individual during late childhood. The gang period extends from approximately the sixth or seventh year to preadolescence, around the twelfth year, and reaches its peak a year or two before adolescent changes begin to appear. During this time, boys and girls find increasing pleasure in being with small groups of their own sex. They find being alone unpleasant and, if restrained from contact with the "gang," "set," or "crowd," for even a day, the child becomes fretful, restless, and unhappy. The gang dominates the child's life. It sets the styles in clothing, the types of play activities engaged in, and the ideals of right and wrong conduct.

Sex Differences.—Gang behavior is more pronounced in boys than in girls. This may be due to several causes. Girls' behavior is more carefully scrutinized than boys', and girls are not permitted the freedom in their play that their brothers have. Many girls are given household tasks after school hours, and this keeps them away from their playmates. Many parents keep the girls in the home for no reason other than that they believe it to be the proper place for girls. Finally, most of the favorite types of play engaged in by boys require a larger number of players than is needed for girls' play, and this motivates boys to collect the gang.

Gang Characteristics.—The main characteristics of gang life consist of an interest in team games and sports of all kinds, as contrasted with individual play; an eagerness to join a group or gang and a pride in being looked upon as one of its members; a group consciousness which results in loyalty to the group and a certain feeling of superiority over all who are not members of the group; an unwillingness to play with members of the opposite sex; and, finally, pronounced secrecy surrounding all of the group activities.

Gangs or groups are sometimes organized and sponsored by adults, as is true of the Boy Scouts, Wolf Cubs, Girl Scouts, Camp Fire Girls, and similar organizations. They may also be formed by the children themselves as a result of contacts in school or in the neighborhood. At first, the groups are generally small in number, but they gradually increase in size as interest in team games and sports necessitates a larger number of players. The average size of these groups ranges from six to eight members, always headed by some leader.

Meeting Place of Gangs.—The meeting place of the gang differs according to the community. In the case of boys, it may be a street corner, garage, barn, shed, space in a cellar, vacant lot, deserted house, school playground, or the corner drugstore. Girls, whose activities are generally more closely supervised than are those of their brothers, usually meet at the home of one of the members of the "crowd," at the school playground, or at the corner drug or candy store. Whatever meeting place may be selected, it is always one where there will be a minimum of adult interference and supervision, so that the activities of the gang may be carried out more or less secretly, and where, at the same time, there will be opportunities for the sort of activities favored by the group.

The gang's rendezvous is usually furnished and decorated by the members of the gang and symbolizes the predominate interests of the gang as a whole. The furnishings generally consist of old, dilapidated pieces of furniture, brought together by the different members of the gang. Boxes with locks, for which each member of the gang has a key, are used as the safety places for the gang's treasures. Perhaps a victrola, a radio, or even an old piano will be among the other articles of furniture. The walls of the rendezvous are usually decorated with pictures of heroes or heroines—ball players, prize fighters, movie stars, or others whom the gang members admire, even though they do not know them. Posters used for commercial advertising or pictures cut from magazines are also used. The walls, as a rule, are covered with pictures, with no attempt at artistic arrangement.

Gang Activities.—The activities of the gang are numerous and vary with the community. The most important ones include play of all types, such as sports, card games, going to the movies or theater; mechanical

and constructive activities; such as making their own rendezvous; social activities in the form of hikes, picnics, parties, and dramatic productions; reading; annoying other people, especially members of the other gangs, members of the opposite sex, and old people; fighting, stealing, gambling, drinking, and smoking, which are forbidden activities at this age; or exploring, which sometimes leads to wandering off for several days or which may be satisfied by camping trips under the supervision of an adult (see Fig. 40).

Gang activities often border on rowdyism. Boy gangsters are apt to be noisy, happy-go-lucky, careless, trick-playing. In many of the boys' gangs, the activities are characterized by a mob spirit which leads the



Fig. 40.—Gang play. (From P. J. Brown, *The sociology of childhood*. Prentice-Hall, 1939.)

individual members of the gang to do things they have learned are forbidden and which they would never consider doing alone. The tendency towards hoodlunism, vandalism, or general annoyance to the community originates within the gang and each member feels obligated, because of loyalty to the gang, to do what the gang does, no matter whether he knows it to be right or wrong. The excitement and reassurance, that come from doing what others do, tend to break down even the most rigidly established codes of behavior.

Forms of Social Behavior.—There are several forms of social behavior which are developed as a result of gang life, one of the most important of which is *susceptibility to social approval and disapproval*. As soon as the child begins to crave the companionship of others, he begins to crave their approval, at the same time, he tries to avoid their disapproval. In

dress, speech, and behavior, he strives to win the approval of those with whom he plays. Should a conflict arise between the standards of the home and those of his playmates, the child will invariably side with the latter because, at this age, their approval means more to him than does that of adults.

Praise and Reproof.—Experimental studies of the influence of social approval and disapproval, in the form of praise and reproof, have shown how susceptible boys and girls of this age are to them. Kirby (1913) found that school children made median gains of 48 per cent in addition and 79 per cent in division when they were encouraged to improve their previous scores. A comparison of the relative values of play, games, praise, and reproof as incentives in an ordinary school situation was studied by Warden and Cohen (1931) who found that praise and reproof were the best incentives to use to improve the accuracy of the work done.

Using group intelligence tests, Hurlock (1924) equated three groups of elementary-school children on the basis of age, sex, and intelligence-quotient scores. She then praised one group by saying: "I have selected you from the whole group who took the tests last week because of the very excellent work you did in that test. You not only made the best marks in your grade, but you did better than most boys (or girls) in grade (mentioning a grade several years higher) do in this test. Today, I am going to give you a test like the one you had last week. I want you to try not only to break your own records, but also to make the group stand first in the school and set a standard for the others who did not do so well." The second group was reproofed in a similar fashion, while the third group was ignored. Praise and reproof were found to be of equal value, and they were capable of raising the average I.Q. scores for the group by 7 points. Less than 1 point increase resulted from practice alone. The older children responded to these incentives more than the younger ones, though praise was more effective for the younger and reproof for the older.

Suggestibility.—Perhaps at no other age in life is the normal individual as suggestible to those about him as he is during this period. The desire to be an accepted member of the group leads the child to comply with the wishes of the group as a whole and accept without question whatever form of activity the leader may suggest. Blatz and Bott (1927), in their investigation of the misdemeanors of 1,437 school children, found that the peak of misdemeanors came, on the average, between the ages of seven and eight years. This, they interpreted as being due partly to the fact that at this age the child passes from the stage of individual play to that of group play, which results in a feeling of loyalty to the group. This loyalty, in turn, renders the child highly suggestible to the leader of the group.

Contrasuggestibility.—While accepting in a more or less unquestioning manner the suggestions of the group, the child begins to revolt against adults and to act in direct contradiction to them. This *contrasuggestibility*, which leads to many misdemeanors, is usually strongest in those whose suggestibility to the group is very pronounced. In the presence of adults, they rebel against suggestions which, had they come from their own playmates, they would doubtless have accepted without hesitation. They stubbornly do what they are warned not to do, as stepping in deep snow when told not to, or leaving their umbrellas at home when their mother tells them to be sure to take them to school.

Rivalry and Competition.—Interest in the social incentives of rivalry and competition becomes very pronounced at this time, as is readily apparent in the interest shown in games and sports. Competition with other individuals, or rivalry between groups, are equally stimulating to the child and may be used as incentives in situations where the activity in and of itself may not prove to be interesting, as is true in the case of schoolwork. Recently, a number of experimental studies by Hurlock (1927), Maller (1929), and others have been carried out to measure the incentive value of rivalry and competition at this age. These studies have shown that regardless of the activity involved, competition proves to be a powerful incentive. In some cases, group rivalry, which involves cooperation within the group, is more powerful than individual rivalry, while in other instances, the opposite is true.

Sympathy.—Sympathy in its true form, involving an understanding of the situation, appears for the first time during these years. However, it is only in its crudest form and lacks the fine sensitivity to situations which appears later. This makes the behavior of the child seem to be somewhat "hard-boiled" or "tough." Bullying and teasing younger children, animals, and servants are quite common at this age. Often jealous rivalry exists between the play groups of boys and girls, and teasing of the girls by the boys is very common.

Good Sportsmanship.—Good sportsmanship, or ability to cooperate with the group to the extent of submerging individual personalities into the group patterns, is an outgrowth of group life. The child soon learns that he must "play the rules of the game," and any infringement upon these, such as cheating, tattling, lying, or the use of underhanded methods, will not be tolerated.

Snobbishness.—Social discrimination, or snobbishness, is an unsocial form of behavior which makes its appearance during late childhood. Members of a play group soon develop the attitude that any member of the group is all right, while anyone who is not a member of the group is inferior to them. This sort of snobbishness, based on whether one belongs or does not belong to the group, is the starting point for adolescent

snobbishness, which is based on wealth, social status, and similar criteria characteristic of adult snobbishness.

Evaluation of Gang Life.—Gang life favors the development of both good and bad qualities in the child. From the point of view of good qualities, it is a socializing experience which changes the child from an individual into a member of the social whole by teaching him to be democratic, to fit his desires and actions into those of the group, to cooperate with the group, and to eliminate selfishness and individualism. At the same time, it develops courage, self-control, fair play, justice, forbearance, loyalty, fidelity, devotion to a cause, obedience to a leader, and many similar character traits which will prove to be necessary to success in adult life.

On the other hand, there are many bad qualities developed as a result of gang activity, such as the use of slang and swearing; the telling of salacious stories and jokes; drinking; disorderly conduct; truancy; an attitude of contempt for laws and lawmakers; the breaking of home ties and shifting of interest from home to gang activities; and the breaking down of ideals established in the home after years of teaching. In reality, many adult criminals among both men and women started their criminal career when they were members of gangs or crowds during their childhood years.

Dimock and Hendry (1929) asked 73 boys who had been to summer camps to tell what are the "biggest things a boy gets out of camp life." The reports given, as presented below, show that the socialization that comes with even as short a contact with others as the boys experienced at camp stood out in their minds as paramount.

TABLE XXX.—QUALITIES DEVELOPED THROUGH CAMP LIFE

	Number of Boys out of 73 Mentioning
Skill in such activities as swimming, canoeing, campcraft.....	39
Learning to get along with others, "mixing," working together.....	35
Better health, physical fitness, strength, posture.....	33
Attitude of helping the other fellow, unselfishness.....	32
Self-confidence, reliance, initiative, thinking for self.....	20
Development of courage and nerve, losing timidity.....	17
Appreciation of nature, out-of-doors, and music.....	17
Meeting and making friends, fellowship.....	16

Source: DIMOCK, H. S., and HENDRY, C. E. *Camping and character*. New York: Association Press, 1929, p. 18.

Later Gang Life.—Continuation of the gang life is seen during adolescence in fraternities and sororities of high schools and colleges. Even in schools and colleges where secret societies are forbidden, the classes are divided into "sets," or "crowds," made up of those of similar interests and tastes. The main purpose of these sets is social. Dances, parties,

and social affairs of all sorts, usually with members of the opposite sex, come to be their main activities.

In a questionnaire study of high-school social activities, Stanforth (1927) found that of the 310 students studied, almost all of them belonged to some high-school club. The most-favored clubs were the music, dramatic, and athletic clubs, while the least popular were the travel, science, foreign-language, and glee clubs. This preference for social activities, it is apparent, differs markedly from the child's interest in sports and rowdy play, characteristic of his gang life.

THE NEGATIVE PHASE

Just before the onset of puberty, from eleven to thirteen years in girls and from thirteen to fifteen years in boys, the child passes through a stage of development characterized by antisocial behavior. Because there is an abrupt reversal of the individual's behavior and a decided backward trend in social adjustments, the name given to this period by Charlotte Bühler (1926-1928) of Vienna, the *Negative phase*, aptly describes it. Fortunately, it is of short duration, lasting for two to six months in girls and slightly longer in boys. It generally ends with first menstruation in girls, and with boys, at the time when secondary sex characteristics begin to appear.

Spirit of Antagonism.—Typically, the boy or girl at this age carries a chip on his shoulder. He is apt to misinterpret what others say or do and to feel that those who were formerly his friends are now his enemies. Both at home and in school, the spirit of antagonism is displayed in a critical attitude toward home, parents, and society in general. The pre-adolescent seems to resent the happy, care-free spirit of others, just as he resents it if he is urged to take part in the activities of his schoolmates. No matter what is done for him, it is not right, and his attitude toward all with whom he comes in contact is apt to be suspicious, unfriendly, and critical.

The desire to withdraw from his former friends and playmates is a natural accompaniment of the socially antagonistic attitude. The pre-adolescent wants to escape from those who he feels are responsible for making him unhappy. It is not at all an uncommon thing for boys and girls at this age to break away from their former play companions and to spend their leisure time alone. Many childhood friendships of long standing are broken at this age because of the misunderstandings and hurt feelings which result from the preadolescent's withdrawal from his old play groups or from criticism of his former friends for being rowdy, childish, or silly.

Desire for Isolation.—The preadolescent, who shows distinct preference for being alone rather than being with his friends, generally spends

his time in reading, daydreaming, or moping. It is during this time that he has an opportunity to think about matters, and he very often comes to the conclusion that he has been badly treated, that no one loves him, and that life is not worth living.

The desire for isolation is, for the most part, the result of the physical condition characteristic of this age. It is a natural outgrowth of the decreased physical energy which accompanies sexual maturing. Because he cannot keep up with the strenuous activities of his former playmates, and because he becomes so fatigued that these activities lose their enjoyment, the preadolescent develops new interests to occupy his leisure time. He secretly envies the pleasures of others but withdraws from the situation in which he feels he is an outcast.

Experimental Investigations.—Charlotte Bühler (1926), in a study of 50 girls in a "shelter" in Vienna, found that during a period of two to nine months before menstruation occurred, all of the girls she studied passed through a phase of restlessness and uneasiness. There was a tendency for the girls to isolate themselves from the others. This phase ended abruptly, following the onset of menstruation, after which ordinary social relationships were resumed.

In a study similar to that of Bühler, Hurlock and Sender (1930) obtained information from 160 junior-high-school teachers about the negative phase and its characteristic behavior. As a supplement to this, they examined the court records of 142 sex-delinquency cases. The results of this study showed that the typical negative-phase behavior, such as desire for isolation, loss of interest in school and friends, restlessness, and withdrawal from companions, was more common in girls from poor homes than in girls from better homes. There was a larger percentage of sex-delinquency cases from the twelve- and thirteen-year groups than from the fifteen-year group.

Blatz and Bott (1927), in a study of the frequency of misdemeanors, such as lack of application, disobedience, or disorder, found the peak for boys at the eight to nine-year level. In the case of girls, the ten to eleven-year and the thirteen to fourteen-year ages were marked by the greatest number of misdemeanors. The peaks at the thirteen to fourteen-year level, they contended, may be considered the result of preadolescent nonsocial behavior.

Play Interests.—The effect of the onset of puberty on the play interests of boys and girls has been studied by a number of investigators. Lehman (1927) noted a marked relationship between the onset of puberty and the decline of interest in playing with dolls on the part of a group of girls ranging in age from $8\frac{1}{2}$ to $18\frac{1}{2}$ years. After the age of $9\frac{1}{2}$ years, there was a rapid falling off in the number of girls of each age group who played with dolls, with the peak coming between $11\frac{1}{2}$ and $13\frac{1}{2}$ years.

This decline in interest in doll play is illustrated by the curves in Fig. 41. There is also a waning of interest in such juvenile play activities as cutting paper things with scissors, dolls, running and romping, playing school, playing house, running races, hide-and-seek, jumping or skipping rope, tag games, dressing up in adults' clothing, or playing jacks (Lehman and Witty, 1930).

In the case of boys, Lehman and Witty (1930) found that puberty is accompanied by loss of interest in running and romping, climbing porches,

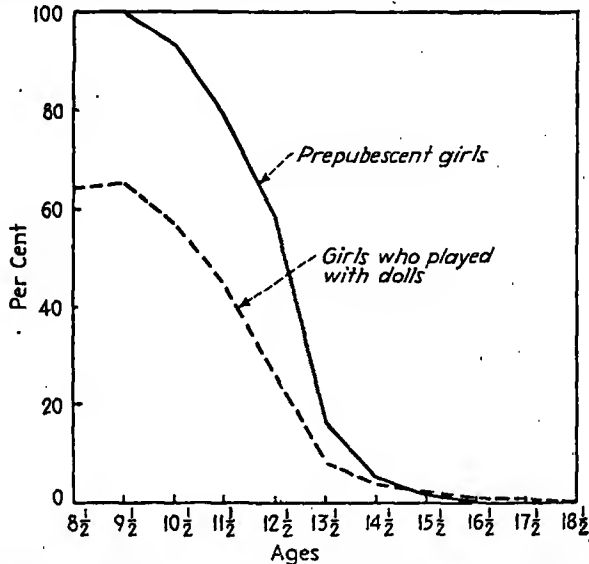


FIG. 41.—Percentages of pubescent girls vs. percentages of girls who played with "dolls, doll clothes, doll carriages, etc.," during the course of one week. (From H. C. Lehman, *A study of doll play in relation to the onset of pubescence*. *J. genet. Psychol.*, 1927, 34.)

trees, or fences, playing cowboy, coasting on a wagon, hide-and-seek, tag games, playing Indian, pillow fights, and police and robbers. Furfey (1926) studied two groups in clubs, a troop of Boy Scouts and a pack of Wolf Cubs. He found that below the age of eight very few boys were interested in joining the clubs, and after fourteen, there was a marked falling off in club membership, caused by loss of interest in play of this sort. With the onset of puberty, gang play gives way to organized athletics and more advanced forms of play.

Causes of Negative-phase Behavior.—The characteristic negative-phase behavior, whether it appear in a pronounced or in a mild form so that it can scarcely be recognized as such, comes from two causes: poor health and poor environment. The preadolescent physical changes are great enough so that temporarily the general health of the individual is

below par. Like anyone who is not in the best of health, the preadolescent behaves in an unsocial way. Poor home conditions, lack of understanding of the situation on the part of parents, inadequate knowledge on the part of the preadolescent of the changes taking place, insufficient food of the right kind, and too many duties outside of the school, all tend to exaggerate this condition, making it more pronounced than it normally would be. The poor environmental factors generally affect boys and girls of poor economic status more than those of better economic conditions, but this is not necessarily the case.

SOCIAL DEVELOPMENT IN ADOLESCENCE

After the puberty changes have occurred and the negative phase is over, strong social tendencies appear, but of a new type. The individual emerges into a transition period, between childhood and maturity, during which he learns to react to the social group in much the same manner as he will be expected to react during his mature years. He likewise discards forms of social behavior which formerly served him well but which now have to be revised or changed to meet the needs of the type of life he lives, in an expanded and diversified social group.

Social Consciousness.—The adolescent, after passing through a stage of self-consciousness, becomes socially conscious. This new attitude toward the social group develops at about the sixteenth or seventeenth year. The adolescent is not only aware that he is a part of a social organization but he also feels that he is duty bound to make some contribution to it. If it does not fit into his ideal of what it should be, he then tries to bring about reforms. Whenever he undertakes any responsibility for group activities, he is serious and hard-working. Often, when he discovers that his efforts are unappreciated, or that the social group will not permit him to make the changes he thinks are necessary, he becomes disillusioned and abandons further attempts to render service to the group.

Conventionality.—Early adolescence is characterized by slavish conventionality. The adolescent is extremely susceptible to the approval and disapproval of the members of his social group. To avoid their criticism and ridicule, he tries to be like them in dress, behavior, and everything he does. Adolescent conformity to the group standard is a means of escape from embarrassment and self-consciousness. By making himself a part of the group, he thus eliminates the probabilities of conflict with the group standards.

Adolescent conformity is even more marked than the conformity to group standards that occurs during the gang age. The adolescent looks upon the social sanctions of his group as of greater importance than those of his parents or the adults with whom he comes in contact. Should any conflict occur, parents find that adolescent sons and daughters protest

that "All the boys do it." If parental permission is not given, the adolescent is very apt to disobey and accept the group standards in place of the parental standards.

Suggestibility.—The suggestibility of the early adolescent years and the tendency to conform to the group is especially pronounced in girls. Boys are more independent and more apt to question a suggestion before accepting it. This is very apparent in the attitude of girls toward rules and regulations. The girls accept, perhaps grudgingly, while the boys are apt to question their fairness and justice. In classes, boys are less docile and receptive than are girls.

Self-assertiveness.—Late adolescence, beginning at about the age of seventeen years, is characterized by self-assertive and "show off" behavior. No longer does the adolescent want to submerge his personality so that he will not be noticed. On the contrary, he does everything he can to be distinctive and thus attract attention to himself. Common methods of self-assertion, characteristic of late adolescence, consist of wearing the newest and most extreme styles in clothing, expressing radical opinions about controversial subjects, doing nonconventional things, boasting of achievements, especially romantic conquests, putting on airs, assuming an affected pronunciation, and engaging in all types of daredevil stunts.

Snobbishness.—Adolescent snobbishness and rudeness are outgrowths of self-assertiveness. The child may be rude, but his rudeness is rarely intentional. Rather, it is due to ignorance or lack of training. Likewise, snobbishness is not of his own making but is the result of snobbish attitudes fostered by his elders. In the case of the adolescent, on the other hand, rudeness and snobbishness are intentional and are not the result of ignorance or of adult influences.

Typically the adolescent treats those younger than he with contempt and scorn. The high-school student feels so superior to his elementary-school brothers and sisters that he resents their presence, and whenever they do the very things which he did only a year or two before, he shows marked irritation and contempt. Likewise, the college student or the adolescent who has gone to work is scornful of the behavior of his high-school brothers and sisters.

Snobbishness toward those of inferior social or economic status, as well as contempt for those whose lack of cultural background makes them seem crude by comparison, occurs frequently during the adolescent years. Instead of covering up his contempt for those whom he considers his inferiors, the adolescent takes great delight in ridiculing them, even though it is apparent that by doing so he is hurting their feelings. It is not at all uncommon to find that both boys and girls at this age scorn their former playmates when it becomes evident to them that these playmates do not have the same social or economic advantages that they enjoy.

Group Loyalty.—Loyalty to the group, a form of social behavior which appeared first during the "gang age," becomes very pronounced during adolescence. It is no longer limited to the gang but extends to the school, the community, and to the nation. Family pride and loyalty are also very marked. The adolescent is proud of his family and likes to boast of its possessions and achievements. He resents the behavior of any member of the family which falls below the social standards of his friends, and he tries to bring it up to that standard.

Cooperation.—Cooperation, likewise a product of the gang age, reaches its peak of development during adolescence. The adolescent learns to subordinate his own interests and to work for the group to which he belongs. Athletics, especially team games and sports, and clubs of all types offer an excellent opportunity for the adolescent to submerge his personality into that of the group and to work for its welfare rather than for personal prestige or gain.

Experimental Investigations.—Characteristic social behavior in the adolescent years has been studied by Leal (1931). In contrast to the negative attitudes toward people and social situations which existed during the preadolescent age, Leal found that at adolescence positive social attitudes predominated. In the boys studied, there were evidences of impatience with restrictions, sympathy for the weak, interest in the opposite sex, avoidance of social contacts with the opposite sex, interest in a particular occupation, evidence of a religious awakening, gregariousness, interest in causes such as the Society for Prevention of Cruelty to Animals, desire to reform others, and loyalty to persons, as contrasted with loyalty to the school which characterized earlier ages. Similar social attitudes existed in girls, except in the case of interest in a particular occupation and loyalty to a person, both of which were absent in girls and were replaced by loyalty to a clique.

The relationship between intelligence and sociability was investigated by Sheldon (1927) in a study of 155 college freshmen. Correlation between measures of intelligence, such as psychological test scores and college grades, and measures of sociability were found to be very low and negative. This meant, Sheldon contended, that the more intelligent students are below the average in popularity. A positive correlation between intelligence and leadership, even though it be small, Sheldon interpreted to mean that intelligence is an asset to leadership in college activities. The popular student is in general likely to be below average in scholarship, while the leader is above average.

CHOICE OF COMPANIONS

In Babyhood.—Even before the baby is a year old, he shows stronger attachments for one person than for another. The attachments are for

the person or persons who take care of the baby and thus further his needs and desires. Adults, during the first year or two of a baby's life, prove to be the most desirable companions because they satisfy his desire for playmates while at the same time satisfying his needs. In addition to that, they play with him when a child of his own age or slightly older engages in play with his own toys.

In Early Childhood.—In the preschool days, the child's companions are usually adults of the family, brothers and sisters, or a few children from the immediate neighborhood. The social environment is that of his home or immediate neighborhood. When he enters school, however, his group of companions widens, and he has an opportunity to select playmates from a larger group than was possible during the preschool days. It is at this time that a real interest in playing with other children shows itself.

In the choice of companions, the older child differs greatly from the baby who willingly accepts as his companions anyone regardless of age or sex who will do things for him. The child becomes more selective in choosing his friends. Such factors as age, intelligence, and good sportsmanship become very important, though the sex of the child is of less importance in determining whether or not he will be chosen as a playmate than it is later.

To the child, a satisfactory companion is one who can do things with him, preferably another child of the same or slightly older age. Adults no longer rank in first favor as companions because they are unable or unwilling to play as the child wishes to play. So long as girls play as boys do, sex distinctions do not enter into social activities at this age, and the social group is composed of members of both sexes. Likewise, the child attaches little significance to difference in nationality, religion, or social and economic status, if the children themselves prove to be satisfactory companions.

Because of the limited environment of the typical child, companions are almost always selected from the immediate neighborhood. This means that the child must choose from the neighborhood children those boys and girls whom he finds to be the most satisfactory companions for him. Should none prove to be of his liking, one of two courses of action are open: either he must modify his behavior to fit into that of the children available as companions, or he may develop "imaginary companions" who will play with him as he wishes.

In a study of friendships among preschool children, Parten (1933) found that the intelligence quotient had little influence on children's friendships as compared with age and home environment. Hagman's (1933) study revealed that the four-year-olds showed a decided preference for companions of their own sex, while the two-year-olds indicated no such

preference. Koch (1933) likewise reported that at the age of four years there was a clear-cut tendency for boys to favor boys and for girls to favor girls.

Imaginary Playmates.—The young child who has, for one reason or another, no real playmates often imagines that he is playing with another child. These imaginary companions are lifelike to the child, possessing names, physical characteristics, and abilities to do things which one normally associates with real children. The child derives keen pleasure from playing with his imaginary playmates, and this fills a gap in his social development.

From the long-range point of view, however, the imaginary playmate is far from an ideal solution to the problem of the only or the lonely child. Having become accustomed to playing with an imaginary playmate who is docile and cooperative, the child develops the habit of domination which, he discovers when he begins to play with real children, cannot be used with such ease and success. When he finds that he cannot dominate the situation in which real children are involved, he becomes a maladjusted member of the group. This necessitates a complete change of attitude and behavior on his part and, if this fails to occur, the child will revert to the imaginary playmate because it is easier and pleasanter to play with him.

Several scientific studies of imaginary companions have been made by Hurlock and Burstein (1932), Jersild, Markey, and Jersild (1933), Svendsen (1934), Terman (1925), and others. They have revealed important facts regarding the child's attitude toward his imaginary playmate. Girls more often have imaginary playmates than do boys, and to girls, the playmates are more realistic than they are to boys. Imaginary playmates are more prevalent among children of superior intelligence than those of average intelligence and among only children or siblings where there is a large age difference. Terman (1925) in his study of children with very high intelligence-quotient scores noted that a large proportion of these children had imaginary playmates at one time or another. The usual age for the imaginary playmate to appear is around the third year, and the age for disappearance, when the child enters school and thus has real playmates.

Imaginary companions in most instances are little boys or girls and only rarely take the form of an adult, a fairy, or an animal. Sometimes they are of the child's own sex and sometimes of the opposite sex. They always have a name. The name may be a commonplace one, or it may be an unusual one, taken from real people, from stories, or created by the child himself. The child plays with his imaginary playmate as if he were a real individual. He even talks to his playmate and in many instances, the child takes his playmate with him wherever he goes. No matter

what the activity may be, the real child is the boss, and the imaginary playmate is a submissive follower.

Gang-age Companions.—When the child enters school and begins to be interested in gang play, new criteria, combined with old ones, are used in the selection of his playmates. Propinquity in the school or neighborhood is responsible for throwing together individuals from whom companions are selected. Unlike the adolescent or adult who may select his friends from a distance, the child must select his friends from the immediate neighborhood in which he lives. Within this neighborhood, he selects as companions those of the same size, sex, chronological age, mental age, social maturity, and interests. Of these factors, mental age and degree of social maturity are perhaps the most important.

Indifference or aversion to the opposite sex is characteristic of late childhood, especially among boys. This attitude reaches its peak just before puberty. Hence, it is not surprising to find that in the selection of companions the child prefers members of his own sex. It is only an occasional gang that accepts in its membership an individual of the opposite sex. If a girl is a member of a boys' gang, she is a "tomboy" and plays the role of a boy. The boy who is willing to be a member of a girls' crowd is generally a "sissy" who will not be accepted in a boys' gang.

Economic differences and social position are unimportant in the selection of friends at this age. Unless home pressure is applied, the child does not discriminate against those of different races, religions, or colors. If their behavior is acceptable, their race, religion, or social position is unimportant. The child does, however, discriminate against those of another school, neighborhood, or gang, not because they are inferior to him in any way but because they belong to a different group.

Dull and very bright children rarely become members of gangs and, as a result, spend most of their time in solitary play or in play with only a limited number of companions of their own intellectual level. The dull child cannot keep up with the gang activities and is therefore not a welcome member of the group. The very bright child, on the other hand, is apt to become bored with the activities of the gang and consequently shows no desire to take part in the activities of others.

Pintner, Forlano, and Freedman (1937), in a study of fifth- and eighth-grade children, found chronological age and mental age more important in determining friendship than personality traits. There was no evidence to show that the children selected friends of opposite characteristics. Seago (1933) reported that two principles are involved in the selection of friends at this age: proximity, and similarity in mental capacity and ability. The mean distance between the homes of friends was 0.26 mile as compared with 0.92 mile from unselected pupils. About 75 per cent of the friends were in the same grade in school. The mental ages of the

friends were closer alike than the intelligence quotients, and there was a marked relationship in athletic ability, cleanliness, courtesy, and personality traits.

Companions in Adolescence.—During the adolescent years, both boys and girls are given greater freedom in the choice of companions than existed before, partly as a result of a broader social environment and partly because of less restriction on the part of parents. Tastes in friendships are fairly well established by this time, and any attempt on the part of parents or relatives to influence the choice of companions is sure to arouse antagonism. As a matter of fact, the more strongly the elders object to the adolescent's friends, the more strongly the adolescent champions their cause, thus intensifying a friendship which otherwise might be of a superficial sort. This is especially true in the friendships with members of the opposite sex.

The adolescent selects as his companions those whose interests and abilities are similar to his. Because his companions are for his leisure-time activities, he wants them to be able to share these activities with him, whether they be social, intellectual, or athletic. Proximity of residence is no longer so important a factor in the choice of friends as it formerly was, since the adolescent's environment is not limited to his immediate neighborhood. The adolescent does, however, consider seriously the economic and social status, the religion, nationality, and color of his friends. He discriminates against those whom he regards as his inferiors in these characteristics. Personal appearance is also an important factor in the choice of companions at this age. The adolescent wants to be proud of his companions, especially if they be of the opposite sex.

Throughout the adolescent years, there is a gradual decrease in the number of companions the adolescent has. As his standards for his friends become increasingly rigid and as his leisure-time activities narrow, he selects from the individuals with whom he associates those who prove to be most congenial. Likewise, there is a gradual tendency to prefer the companionship of members of the opposite sex. By the age of sixteen years, the adolescent's companions are about equally divided between the two sexes. By eighteen or nineteen years, however, it is normal and usual to find that the adolescent prefers the companionship of members of the opposite sex to that of members of his own sex, and that he spends an increasingly large percentage of his leisure time with them.

Studies of high-school friendships, formed during the *early years of adolescence*, have revealed some interesting facts about friendships at this age. Williams (1923) reports that what boys look for in friendship are fairness, fun, sportsmanship, friendliness, and athletic ability. In the case of boys, twelve to seventeen years of age in a summer camp, Partridge (1933) observed that "best friends" were nearer in mental age than

in chronological age. Boys selected their friends from a group of boys of their own chronological age and showed a preference for those of like mental age. Socioeconomic status of the parents, Jenkins (1931) found to be an important criterion in the selection of friends in junior-high-school groups. Boys and girls at this age choose their friends from the same or a higher socioeconomic level more often than from a lower level. Wellman's (1926) study of junior-high-school students revealed that girl friends were more alike in scholarship than in other characteristics, while boy friends were more alike in height, intelligence quotient, and chronological age than in scholarship.

Studies of college friendships have revealed the criteria used in the selection of friends during *late adolescence*. Vreeland and Cory (1935) report that the degree of neuroticism and the social intelligence of the individuals, as measured by tests, are factors of importance in the selection of friends. Fleming (1932) found approximately the same results in a study of college sophomores. Among the men, introverts sought introverts as their friends and extroverts sought extroverts. In the case of college women, the friends selected were more alike in pleasingness, achievement, and social intelligence than was true of the men. Garrett's (1920) study of freshmen "best friends" revealed them to be considerably alike in college achievement. This he explained by the fact that they take the same courses and study together. Thus, their college grades are the joint products of mutual endeavor.

LEADERSHIP

In any group of children, no matter how young the children may be, the relationship is seldom one of equality. One individual usually stands out as a recognized leader. Popularity and leadership are not synonymous, though they are usually found together. A leader is always popular, though a popular individual is not necessarily a leader. Many popular individuals at every age are liked because they are easygoing and readily adapt themselves to social situations, but they lack other qualities that a leader must necessarily have.

First Appearance of Leadership.—Leadership ability shows itself as soon as two children are placed together. The dominant child takes the toys that appeal to him. Should the toy be in the possession of another child, he will push, pull, kick, and do everything within his power to get it. By the age of ten months, the baby is usually conscious of his triumphs, and a smile of self-satisfaction lights up his face. The baby who has been forced into a position of submission looks sorrowful, whimpers, or cries.

When Bühler (1930) placed two babies, 6–10 months old, facing each other, their behavior showed active seeking of contact with the other by

touching, exchanging toys, pushing, and pulling. The older, physically stronger, and more skillful baby dominated. Shirley (1933) studied the social behavior of babies in a baby-party situation in which three or four babies, born within a week of each other, were brought together for the first time when the babies were forty-three weeks old. She found that they paid little attention to one another, except to pull at one another's toes and to reach for each other's hair. When one toy was given to two of them, more aggressive and resistant behavior occurred.

Leadership in Early Childhood.—The child leader is characteristically superior to the other members of the group in size, intelligence, and generally in age. Because of his superior age and intelligence, he has more suggestions to offer for play, and thus the other children are willing to follow his lead. Sex is an unimportant factor in leadership at this age. Girls often assume the role of leadership over boys as well as over other girls. Likewise, social status, nationality, or physical attractiveness are not as important qualities now as they will be later. Fairness and social responsibility to the group, on the other hand, are important characteristics of the child leader.

At first, the child tries to dominate other children by the same technique that he used for adult domination, namely, crying, hitting, and temper outbursts. He soon discovers that this does not prove to be as effective as when used on adults, and he then modifies it. There is, however, during the early childhood years, a marked tendency for the leader to be the tyrannical boss of the group. Little consideration for others appears in the leader's behavior. He expects them to follow his wishes in an unquestioning manner and becomes angry or sullen if they rebel. Should his technique become too tyrannical, the leader finds himself displaced and another child is recognized as the new leader by the group.

Parten (1932a) observed two definite types of leaders at the nursery-school age: the "diplomat," who leads a large number of children by artful and indirect suggestions, and the "bully," who uses brute force to boss a small group chosen as his own gang. In an analysis of "ascendant behavior," Jack (1934) recognized two types: pursuing one's own purpose against interference and directing the behavior of one's companions. To measure ascendant behavior, Jack placed three groups of toys, sand toys, celluloid farm animals, and a car and truck, in three corners of a sand box. Preschool children were allowed to play with these materials, and their behavior during the play was carefully observed. Ascendant behavior, she noted, was accompanied by social responsiveness, a tendency to resist adult control, and expressions of a rivalrous, competitive attitude. In attempts to control the behavior of others, the children used bargains, reproof, and threats. Self-confidence seemed to underlie all manifestations of ascendance.

Gang Leadership.—During the gang age, the leader represents the group's ideal. He must be a good athlete and an all-around good sport. As boys of this age are subject to hero-worship, it is natural for them to follow the person who possesses the traits they most admire. Should the leader fall short of the group's expectations, and should he display traits which they dislike, he soon loses prestige and is replaced as leader by another who, at the moment, more closely approximates the group's standards.

The characteristics of the leader at the gang age have been extensively studied in experimental investigations. Expressed in the boys' own words, Puffer (1905) listed the following leadership qualities: 14 said that the leader was the oldest; 13, that he was the largest; 13, best player; 10, best fighter; 6, wanted to lead; 6, was good-natured or generous; 5, smartest; 4, started games; 3, best stealer; 2, highest grade in school; 2, had most money.

Caldwell and Wellman (1926) studied boy and girl leaders from the seventh, eighth, and ninth grades of the Lincoln School of Teachers College, Columbia University. These children were selected by their classmates as class presidents, student-council members, members of the school-magazine staff, athletic captains, science-club officers, and citizenship representatives. The outstanding characteristics were found to vary with the types of activity in which the representatives were engaged. Scholarship was high for all types of leaders, but especially so for the student-council, magazine-staff, science-club, and citizenship representatives. Physical achievement was an outstanding characteristic of the athletic leaders but did not hold a prominent position among the other leaders. The leaders in all lines of activity had the same, or slightly less chronological age than the average of the class. The girl leaders were about average in height, while among the boys, the class presidents and athletic captains were the tallest of their classes, and the magazine representatives were among the shortest. Extroversion was more marked than introversion in all the leaders.

In addition to the qualities referred to above, Block (1910) has listed another, that of fairness in settling disputes which arise within the group. Such a leader is regarded as the gang's judge. Because he is fair-minded and does not take sides, the members of the gang are willing to entrust decisions to him. Respect for the leader is thus based on character rather than on physical strength.

Partridge (1934) studied leaders in Boy Scout groups around New York City and in boys' camps. He found that the outstanding leaders excelled their fellows in every characteristic studied. They were all-round superior individuals as compared with their associates. The boys rated as most important traits for leadership the following in the order

of importance: (1) intelligence; (2) dependability; (3) appearance; and (4) athletic ability. There is usually some distinguishing physical characteristic about the gang leader. The outstanding leaders could be identified from the nonleaders consistently on the basis of voice or sight alone, but the identification was more accurate when both voice and sight were used.

Adolescent Leaders.—The outstanding qualities of leaders during the adolescent years have shown that intelligence and fairness rank in first place as leadership qualities, followed closely by such traits as pleasing appearance, good sportsmanship, scholastic standing, and socioeconomic position. From a case study of 16 leaders in a junior college, Spaulding (1933) has suggested that there are five possible types of leaders during the adolescent years. These are the social climber; the intellectual success; the good fellow; the big athlete; and the athletic-activity type. Prestige coming from success in one activity leads to popularity which carries over and results in the election into other positions of leadership.

Studies of high-school leaders by Bellingrath (1930) and Brown (1933) have brought out other important leadership traits. Bellingrath found a positive relationship of age, home background, and ambition to continue education, to leadership in the case of boys, while, in the case of girls, the leaders were taller, heavier, younger, had better school grades, better school habits, and better home backgrounds than had girls who were not leaders. Brown reported that high-school leaders conform to a pattern of characteristics frequently associated with leadership; high intelligence, high scholarship, and parents with occupational status above average.

In the study of the physical characteristics of student leaders in colleges of the United States, Bowden (1926) came to the conclusion that these are the least important of all the characteristics. The popularity and influence of the leaders, he found, was not so much physical as mental. The quality of their intelligence and their reactions to the social environment proved to be of greater importance than their appearance. Most of the leaders were of the extroverted, expansive social type. There were no "freak" personalities found among the leaders studied by him.

CHAPTER X

PLAY

The play of children is one of the most commonly observed activities of child life. Parents, educators, and public officials recognize its importance for child development, and each year more and more provision is made for play, whether at home, in school, or in public playgrounds. Because play is so important in the development of the child, psychologists have studied it not only from the point of view of the favored forms of play at different ages but also from the point of view of individual differences and the effect play has on the child's mental and physical development.

Definition of Play.—*Play* is a term so loosely used that its real significance is apt to be lost. It relates to any activity engaged in for the enjoyment it gives, without consideration of the end result. It is entered into voluntarily by the individual and is lacking in external force or compulsion. The individual plays for the fun of playing and for no ulterior motive. It differs from *work*, which is an activity toward an end, in which the individual carries out the activity not because he enjoys it but because he wants the end result.

Some writers have attempted to make a distinction between work and play activities, but there are no activities which may be classed as either one exclusively. Whether they belong to one category or the other depends upon the individual's attitude toward them. Collecting may be a form of play for a child or an adult who makes it a hobby, but it may also be work for the person who collects articles to sell at a profit. Drawing may be a pleasant pastime, engaged in by child or adult; but, if the motive is to enter one's drawings in contests to compete for prizes, or to earn a living as an artist, drawing becomes a form of work rather than play. Any time that a play activity is directed toward an end other than enjoyment, as in the case of competitive games and sports, it assumes the aspect of work.

Source of Play Activities.—Many play activities of young children are imitations of adult activities. The child, in his play life, reproduces the activities he has observed among the adults of his environment. Because the activities in any community are more or less stereotyped in form, especially the activities of the home, the play of little children is very similar, regardless of the neighborhood environment in which they

CHARACTERISTICS OF CHILDREN'S PLAY

The play of children is in many ways different from that of adults. There are also certain characteristics of child play which may be found in whatever group of children one studies. These outstanding characteristics serve to show how different child play is from adult play. The outstanding characteristics of child play are as follows:—

1. Play Follows a Pattern of Development.—From early babyhood to maturity, certain definite play activities are popular at one age or another, no matter what the environment, the nationality, or economic status of the child. Even though the popularity of a given type of play may rise and fall and the form of activity change with increase in maturity, there is no definite beginning or end to a given play activity. The time when the play is especially popular, however, is much the same from one group of children to another.

Toy play is engaged in during early childhood and reaches its peak around the seventh or eighth year. Following this comes a decided interest in running games, and after that sports, with strict rules and regulations, become the favorite pastimes. Likewise reading interests, interest in movies, music, pets, and collecting, all occur in a more or less regular order and at times which conform to a pattern of development.

Gesell (1940) has made an extensive investigation of the play of children during the first 5 years of life and has noted a definite sequence in the development that occurs during that period. In the accompanying table are given the characteristic forms of play at successive ages.

TABLE XXXI.—DEVELOPMENTAL SEQUENCES IN PLAY ACTIVITIES

15 months	1. Endless exercise of walking activities.
	2. Throws and picks up objects and throws again.
	3. Puts one object after another in and out of receptacles.
18 months	1. Very rapid shifts in attention especially expressed by gross motor shifts. Moves actively from place to place and "gets into" everything.
	2. Pulls toy.
	3. Carries or hugs doll or teddy bear.
	4. Imitates many things such as reading newspaper, sweeping, dusting.
	5. Solitary or onlooker play.
24 months	1. Less rapid shifts in attention. Interest in dawdling and manipulating play material to feel, pat, and pound.
	2. Interest in dolls and teddy bears (domestic mimicry); beads (strings them), or drops them in holes in tops of boxes or cans only to dump them out and repeat the process; blocks and wagons (transports blocks in wagon more than building with them).
	3. Does not imitate things which he remembers, but only those events which are present to his senses.

TABLE XXXI.—DEVELOPMENTAL SEQUENCES IN PLAY ACTIVITIES.—(Continued)

	4. Parallel play predominates when with other children, though he obviously enjoys being with other children.
	5. Little interest in what other children do or say, but may hug them or push them out of the way as though they were physical objects.
	6. Little social give-and-take but much physical snatch and grab accompanied by defending rights by kicking and pulling hair which may end in hilarious scuffle.
	7. Does not ask for help; adult must be constantly watchful and ready to help him without waiting to be asked.
36 months	1. Dramatization and imagination beginning to enter into play.
	2. Interest in combining playthings such as blocks and cars, making roads, garages, and bridges.
	3. Increasing interest in playing with other children rather than playing alone. May play in groups of two or three, but these are constantly shifting in make-up and activity.
	4. Cooperative activity taking the place of physical contacts.
	5. Is willing to wait his turn.
	6. Will put away his toys with some supervision.
48 months	1. Considerable increase in constructive use of material and in manipulation and dramatization of play.
	2. Has very complicated ideas but is unable to carry them out in detail, and has no carry-over from day to day.
	3. Prefers to play in a group of two or three children. Often chooses favorite companion of own sex.
	4. Suggests turns but is often bossy in directing others and is often silly in his play and may do things wrong purposely.
	5. Puts away toys by himself.
	6. Marked rise in activity.
	7. Likes to "dress up."
60 months	1. Very fond of cutting out and pasting and in working on a specific project, such as a store or a boat (project is carried over from day to day), and in dressing up in adults' clothes.
	2. Definite interest in finishing what he has started even though it takes several days.
	3. Plays in groups of two to five. Friendships are becoming stronger.
	4. Spurred on in activity by rivalry.
	5. Interest in going on excursions.

Source: GENELLI, A. *The first five years of life*. New York: Harper, 1940, pp. 251-252. Quoted by permission.

From the genetic sequence of activities listed above, it may be seen that the play of little children passes from simple motor activities with toys to socialized play and then to dramatic and constructive play.

Partridge (1938), in a study of the play of boys in New York City, found a definite increase in interest in riding in an auto and arguments, and a steady decline in interest in cowboy movies, making airplanes, marching in a parade, and detective stories from twelve to seventeen years of age. Studies of doll play have indicated that interest in dolls reaches a peak before puberty and after that shows a rapid decline.

Block building, Johnson (1933) noted, passes through four distinct stages in development. In the first stage, the child gets experience by handling, carrying, and piling blocks in irregular masses; in the second, construction of rows and towers begins; in the third, patterns and techniques develop; while in the fourth, the child dramatizes and reproduces actual structures.

2. Play Activities Decrease in Number with Age.—The gang age is often described as the “play age,” not because more time is devoted to

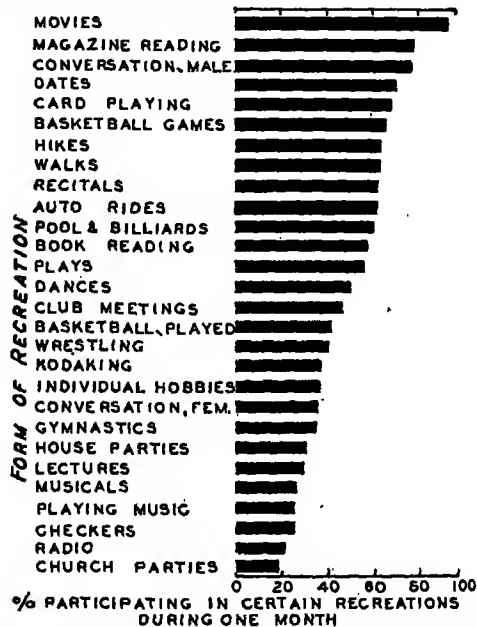


FIG. 42.—Percentage of college freshmen men participating in certain recreations during one month. (Based on data of S. M. Stoke and W. F. Glive, *The avocations of one hundred college freshmen*. *J. appl. Psychol.*, 1929, 13, 257–263. From F. K. Shuttleworth, *The adolescent period*, *Monogr. Soc. Res. Child Developm.*, 1938, 3; No. 3.)

play, as the name would suggest, but because a greater variety of play activities is engaged in than at any other time. There is an overlapping of the play activities characteristic of childhood and those of the adolescent years. Consequently, it is not at all unusual to find the nine-year-old playing with dolls, trains, or other childhood toys while at the same time taking an active interest in sports of the high-school or college ages, such as baseball, basketball, or football.

Investigations of the number of play activities engaged in at different ages have shown that young children engage in a larger number than do the older ones. The eight-year-olds, studied by Lehman and Witty (1927), reported an average of 40.11 different play activities engaged in

during a week as contrasted with an average of 17.71 per week in the case of those twenty-two years old or older. Social play activities, involving play with other children, likewise decrease in number with age. At $7\frac{1}{2}$ years, an average of 27 are engaged in, as compared with 21 at $11\frac{1}{2}$ years, and 13 at $16\frac{1}{2}$ years (Witty, 1931). In Fig. 42 is shown the limited number of recreational activities engaged in by adolescent college students.

Decrease in the number of play activities is due partly to less time available for play, partly to a greater understanding of their interests and abilities on the part of the members of the older group, and partly to a longer attention span which enables older children to enjoy one play activity for a longer time than is possible with a younger child.

3. Time Spent in Play Decreases with Age.—Babies and young children spend most of their waking time in play. Except for bathing, dressing, eating, and toileting, the young child's waking hours are free to spend as he wishes. As he grows older, however, his leisure time decreases because of new duties imposed on him and because of the time spent in school. The result is that the child must select, from the different play activities, those which please him most and concentrate on them. This becomes increasingly true as the child reaches adolescence and his leisure time is more and more limited.

4. Time Spent in Specific Play Activities Increases with Age.—Because of poor concentration, little children go from one toy to another or from one play activity to another. The result is that they must have a large number of playthings if their interest is to be sustained. This holds true for being read to or hearing stories. The young child can listen for only a short time before his attention wanders to something else.

Observations of the play of nursery-school children by Van Alstyne (1932) revealed that at two years the average span of attention was 6.9 minutes; at three years, 8.9 minutes; at four years, 11.4 minutes; and at five years, 12.6 minutes. The length of time spent in a specific play activity depends also upon the activity itself. The longest median time a three-year-old spent in one activity Bridges (1929) found to be 15 minutes in brick building, and the shortest, 3 minutes, on the lacing frame. The median time a four-year-old spent in one play activity was 6.2 minutes. This, Bridges explained, arose from the fact that four-year-olds can complete a given play activity more quickly than three-year-olds, and the shorter time therefore represents greater speed rather than lack of concentration.

5. Childhood Play Is Informal.—The play of little children is spontaneous and informal. The child plays when and with what toys he wishes, regardless of time or place. He does not need special play equipment. As a matter of fact, he often derives more pleasure from playing with objects belonging to adults than from his toys. Likewise, he does

not need special play clothes. He plays just as often when dressed in his best clothes as when he is wearing play clothes. A special place reserved for play is not necessary at this age; and he does not make appointment to play at a certain time, as adults do.

Gradually, play becomes more and more formal and much of the spontaneity of the child's play disappears during adolescence. Even during the gang age, the child feels that special clothing, as a baseball suit; special equipment, as a tennis ball instead of a rubber ball; and a special place for play, as a baseball diamond or tennis court, are essential. Appointments to meet and play at a definite time are made, and each player is expected to appear promptly so as not to inconvenience the other players. This trend toward formality in play increases every year with the result that, in adolescence, play is a serious thing, and not the informal, casual activity that is so enjoyable to the young child.

6. Play Is Less Physically Active as the Child Grows Older.—The adolescent's play involves little energy. This contrasts markedly with the play of little children, which is very active. Likewise, it is very different from the play of older children, who prefer games and sports of the most active type and who care little for the sedentary play activities so popular during the adolescent years.

PLAY IN EARLY CHILDHOOD

Play, at first, is very simple, consisting primarily of random movements and stimulation of the sense organs. Later, with development of intelligence, play becomes increasingly complex. There are three different forms of play engaged in by young children: (1) *free, spontaneous play*; (2) *make-believe play*; and (3) *constructive play*. Each of these begins as a simple activity and becomes more complex with increase in intelligence and motor coordination.

1. FREE, SPONTANEOUS PLAY

The earliest play to make its appearance is free, spontaneous play. This type of play is characterized by lack of rules and regulations and is, for the most part, solitary rather than social. The child plays as he wishes to play and stops playing when he is no longer interested in it. This is especially pleasurable in the case of young children who find it difficult to play in a definite way or to conform to rules and regulations. Informal play of this type loses popularity late in childhood, when competitive games are more favored. By the time the boy or girl reaches adolescence, there is no longer an interest in the free, spontaneous play that proved to be so enjoyable to the young child.

Play of this type is mostly exploratory. The baby derives keen enjoyment from stimulating the sense organs and thus experiencing different

sensations. At first, most of his play is with his limbs because lack of motor coordination makes play with toys very difficult. By the time the baby is three months old, control of his hands is well enough developed to enable him to play with toys or any objects within his reach. He explores his toys by sucking, banging, and pulling at them and investigates objects such as cloth, fur and wool, eyeglasses, or watch chains.

Pattern of Free, Spontaneous Play.—Shirley (1931a) studied locomotor play, or play involving gross motor activity, in babies under two years of age. She found that their play conforms to a general pattern of locomotor development, accompanying skills of different orders. The pattern she found was as follows:

First-order Skills.—Birth to twenty weeks. There are only a few play responses at this age, consisting mostly of reaching for objects, stepping, turning from back to side, kicking, bouncing, wiggling, and reaching for the toes. At this age, motor play is mostly for exercise rather than for the enjoyment of the activity.

Second-order Skills.—Twenty to thirty-four weeks. At this time, play loses its random, hit-or-miss character. It consists of play with the toes, bouncing, squirming, head shaking, leaning, dancing, pulling self to a stand, and cooperative motor games, such as "patacake" and "rockabye-baby."

Third-order Skills.—Thirty-two to forty-five weeks. Play activities at this age include kicking, bouncing, leaning over chair arm or carriage, rolling, playing with toes, pulling self to a sitting position, crawling for toys, or trying to stand.

Fourth-order Skills.—Forty-one to fifty weeks. With increased skill, the baby's play is more developed in form and includes play in a sitting posture, climbing, standing, creeping, and moving furniture.

Free, spontaneous play involves the use of toys, though toys are not essential. After the child has explored his toys extensively enough to find out how they work, he uses them for make-believe play or construction. Owing to poor motor coordination, the little child, during this exploratory period, is apt to be very destructive. He pulls to pieces or breaks his toys, not willfully, but unintentionally, because they are not strong enough to withstand the strain that the child's exploratory behavior places on them. This holds true also for household articles, which he explores whenever he has an opportunity to do so.

By the end of the second year, the child turns his attention to more advanced and complicated forms that tax his developing mentality to a greater extent than the simple, free play of babyhood. At times, he reverts to this play for a year or two, but with each year, it becomes less and less satisfying to him. As a result, he abandons it in favor of play of a more advanced and highly organized type.

2. MAKE-BELIEVE PLAY

Make-believe play is play in which the child, through language or overt behavior, deals with materials or situations as if they had attributes other than those they actually have. Dramatic impersonation begins between the ages of $1\frac{1}{2}$ and 2 years. Children learn much of their make-believe play from older children, especially siblings. In a group of children of wide age range, there is more imaginative behavior than in a group of the same age and sex, because the younger children learn imitatively from the older children in the group (Markey, 1935).

Pattern of Make-believe Play.—Studies of make-believe play in children have shown that it follows a definite pattern in its development. Markey (1935) noted that children under three years of age showed a predominant interest in *personification*, such as talking to dolls or inanimate objects, or games involving imagined creatures, as a "bogey man"; in *make-believe use of materials*, including the imaginative naming of objects, as calling a slide a train, or simple, overt, imaginative behavior, as drinking from an empty cup; and in *make-believe situations*, involving a complicated use of materials, such as playing house. In most instances, their play is related to the materials before them. After three years of age, *make-believe use of materials* proved to be the most typical imaginative activity. As children grew older, the materials were used in increasingly more complicated ways, such as using sand to build a tunnel instead of merely digging into it with a shovel. In addition to this, children after three years of age engage in play involving *make-believe situations*, *constructive activities* with raw materials, and *dramatic play* of a more or less complicated type.

Forms of Make-believe Play.—The make-believe play of children is a mirror of the culture which surrounds them, in that it dramatizes events of their everyday lives. In a sample of approximately 300 episodes, Murphy (1937) found the following patterns of imaginative play: (1) *domestic patterns*, including playing house, furnishing a house, cooking, eating, having tea parties, taking care of babies and being fathers and mothers; (2) *selling and buying*; (3) activities connected with *transportation*, as riding in automobiles or trains, being engineers, putting in gas or air, and sailing boats; (4) *punishing*, playing policeman, and gun play in general; (5) *burning* and playing fireman; (6) *killing and dying*; and (7) playing the part of *legendary persons*, as Santa Claus, Cinderella, and the Big Bad Wolf.

Parten (1933) found "playing house" to be very popular with pre-school children. The younger children were passive participants who allowed themselves to be led around by the older ones who had assumed roles of "mother" or "daddy." The two- and three-year-olds imitated

home situations, playing alone generally, and dressed or undressed their dolls, put them to bed, or rocked them. Children over three years of age "played house" as a complex activity, in which they reenacted events of the home, such as setting the table, having the doctor for a sick baby, calling on the telephone, taking a doll for a ride in a coach, spanking a doll, and putting it to bed. This play sometimes involved the use of younger



FIG. 43.—Make-believe play with a domestic pattern appeals to the young child. (From *Parents' Magazine*, August, 1939. Photograph by Frederick Bradley. Courtesy of *Parents' Magazine*.)

children as "babies" in place of dolls. Figure 43 shows how domestic work is enjoyable play for a little girl.

Older children dramatize the stories they have heard or read and the movies they have seen. Instead of playing that they are people of everyday life, they play that they are fairies, Indians, Napoleon, Robin Hood, "G" Men, or bandits. "Playing School," Lehman and Witty (1926) observed, is a popular form of dramatization after children reach the

school age. It is, however, more common among Negro than among white children, and this, they explained, is a form of compensation.

Dramatizations are reproduced with astonishing fidelity and even the tone of voice of the person imitated is copied so well that one could almost believe the real person was speaking. Few stage properties as such are needed. A hat, cane, long skirt, or some articles of clothing usually associated with the person imitated is all the child needs to imagine that he is that person. A rug placed across two overturned chairs or the carpet pulled up at one end for the child to crawl under serves as a tent, a den, or cave. The basement becomes an ogre's den, the hallways of the house are secret passages in a castle, and the lawns, the battlefields where important contests are fought. Each year, as the child grows older, he pays more and more attention to details, with the result that stage properties are increasingly important to his dramatizations.

3. CONSTRUCTIVE PLAY

Interest in construction is an important element in the play of children. Up to the age of five or six years, construction is more or less a matter of chance. The child puts together objects without a preconceived plan or pattern, and if, by chance, they should resemble a familiar object, he is delighted with his achievements. From the age of six years, materials are used specifically and appropriately for building and construction.

Forms of Construction.—Early forms of constructive play consist of making mud pies, constructing mountains or tunnels from sand, and playing with blocks, beads, scissors, clay, paint, crayons, and paste. The child uses these to make things that have a definite meaning and can be recognized as such, though their practical use is of secondary importance. Guanella's (1934) study of block-building activities revealed that shortly after the second year children gave names to their structures, as "house" and "boat." After the third year, block construction was coordinated with dramatic play. Figure 44 shows how block building can engross the attention and interest of children.

Constructive play is popular in late childhood and manifests itself in the building of tents, playhouses, huts, snowmen, and dams. It generally takes the form of large crude work in the case of boys and is carried out in connection with their outdoor play. Among girls, on the other hand, construction is of a finer and more delicate sort, as is seen in making doll clothes, paper dolls, drawings, painting, or clay modeling. Because of its popularity at this age, it is one of the important phases of the routine life at summer camps for boys and girls. Here, all kinds of articles are made, such as stools, benches, shelves, baskets, rugs, costumes and scenery for plays, and even hand-made jewelry.

At first, the child is pleased with whatever he makes and proudly displays it to anyone who happens to be present. Later, however, he becomes more critical of his workmanship and not only ceases to boast about it but often covers it up or even demolishes it if others come to look at it. This is especially true of drawing and painting. As the child reaches the adolescent years, his interest in constructive play wanes



FIG. 44.—Block building is a favorite form of constructive play. (*From Parents Magazine, March, 1938. Photograph by McCambridge Photographers, New York.*)

rapidly unless he has a definite talent for painting, carving, or clay modeling. Under such conditions, it becomes a hobby which is engaged in as his favorite form of solitary play, then and into maturity.

TOYS

Childhood Is the "Toy Age."—From babyhood until adolescence, toys play an important role in the life of the child. At first, the baby uses toys

for exploration. He shakes, rattles, pulls, pushes, sucks, and uses whatever other methods he can to discover what the toys are, how they work, and all about them. Several years later, toys are used for play in imitation of adult activities and, still later, for dramatic, make-believe play. As the child approaches adolescence, his play interests shift from toy play to games and sports with the result that his need for toys passes. He may, however, cling to a favorite toy because of some sentimental attachment for it and use it as a "keepsake" rather than as a plaything.

Toy Preferences.—When given complete freedom in the choice of play materials, which type will the child choose? This question has been subjected to experimental analysis in the case of preschool and kindergarten children, during the free-play periods. Parten (1933) observed the favorite play activities to be playing in the sandbox, playing family, house, and with dolls, pulling or hitching a sectional train, and riding a kiddy car. The least favored play activities were looking at an object or picture, stringing beads, painting, and sitting unoccupied.

Toys preferred by three-year-olds, according to Bridges (1929), are cylinders to be fitted into holes in a wooden block, blocks of wood for playing purposes, and pairs of brilliantly colored pieces of wood to be matched and arranged in rows of pairs. Next in preference came building with cubes and chalking on a blackboard. The five least often selected play materials were the Montessori pink tower, brush and paint for switching, lacing material in a frame, stuffed animals, and a china tea set.

Four-year-olds, according to Hulson (1930a), show a definite preference for blocks which are used primarily for construction, and these constructions are spontaneously named by the children. The predominant type of construction is reproduction of an object from the child's environment, the most favored form of which is a house. Playing with sand, kiddy cars, and seesaws is also popular, while blackboards, dolls, and animals prove to be the least popular play materials. Bridges (1929) likewise noted a preference for materials suitable for creative play at this age. The most popular play activity for both boys and girls proved to be making simple patterns by tracing around little insets with colored crayons. Next in popularity were the colored cubes used for construction, while the easiest set of wooden cylinders ranked third.

"Do-with" Toys.—Instead of toys which are complete and perfect, as viewed by the adult, the child needs toys that can be *moved, changed, and manipulated*, according to the desire of the child. When too automatic or too complete, the toy leaves nothing for the child. Or, if the toy does just one thing, as for example, in the case of a mechanical duck that walks when wound up, the child loses interest in it as soon as the novelty wears off. Noise makers, as squeakers or rattles, give an element of variety to a toy and thus add to its attractiveness for a child. The

kitchen cabinet provides ideal "do-with" toys for the young child, as Fig. 45 shows.

Time Spent on Toys.—How long a child will spend playing with toys, or with one specific toy, depends partly upon the child and partly upon the toy itself. In Bott's (1928) study of toys, mechanical toys were found



FIG. 45.—Ideal "do-with" toys for the young child. (From *Parents' Magazine*, October, 1939. Photograph by Bob Lavitt.)

to occupy the longest play periods on the part of preschool children. In the following table are given the percentages of time spent on each of four

TABLE XXXII.—TIME SPENT WITH PLAY MATERIALS

Type	Two-to three-year-olds, percentage of time	Three- to four-year-olds, percentage of time	Over four years, percentage of time
Raw materials.....	29.0	37.4	42.4
Locomotor.....	25.3	31.3	27.9
Pattern.....	23.2	19.4	23.9
Mechanical.....	22.5	11.9	5.8

Source: BOTT, II. Observation of play-activities in a nursery school. *Genet. Psychol. Monogr.*, 1928, 4, 75.

types of play material: raw materials, locomotor toys, pattern toys, and mechanical toys.

These figures show that raw materials rank highest in time spent for the two younger groups and second in popularity for the oldest group. Mechanical toys, on the other hand, occupied the least time for all three groups.

Decline in Toy Play.—The peak of toy play is reached in most cases between the ages of six and eight years. From then on, less and less time is spent in toy play. The explanation of this is twofold. In the first place, the child's play interest changes, and he begins to substitute games, sports, reading, and other more mature types of play for those formerly engaged in. These new types of play do not necessitate toys. Secondly, relatively few toys are complex enough in form to enable the child to do much with them. With increase in intelligence, the child needs play materials that will tax his more mature intellectual status.

PLAY IN LATE CHILDHOOD

From the time the child enters school, his play interests begin to change. During the first year or two of school, there is an overlapping of play activities characteristic of early childhood and those characteristic of late childhood and adolescence. The favored play activities of early childhood persist for a few years while, at the same time, new play interests are developing. This leads to a wider range of play activities than occurs at any other time and, for that reason, late childhood is often called "the play age."

Types of Play Activity.—The most important play activities in late childhood include: (1) *collecting*; (2) *games and sports*; and (3) *amusements*, in the form of reading, movies, and listening to the radio. Each of these will be discussed separately.

1. COLLECTING

From the age of three years, there is a desire on the part of every normal child to collect things which interest him temporarily. In *early childhood*, the things collected are usually valueless and trivial. Once they are collected, they are generally forgotten or little attention is given to them. They are put in the child's pockets, or in some special place in the playroom, and then forgotten.

From six years to adolescence, there is a strong tendency on the part of children to make collections. In fact, this is one of the most popular forms of play among boys at that age, though girls, as a rule, collect more things than do boys. Durost (1932) found the largest number of collections for boys at ten years of age, and for girls at eleven. The age at which the peak occurs differed, however, according to the intelligence of

the children. In general, the lower the intellectual level the higher the age at the peak of collecting activity. At this time, collections are kept in some place where they will not be disturbed, as attics, cellars, desks, old trunks, jars, or baskets.

Objects Collected.—At first, children collect anything that attracts their attention. Later, they become more selective in their choice of objects and collect only a few things which, at the moment, interest them especially. A number of investigations have been made to discover just what children collect at different ages. These investigations have shown marked similarity in the lists of objects reported in the collections. A representative study of this type was made by Whitley (1929) from information obtained from 4,446 children, ranging in age from seven to eighteen years. In the lists given below, abbreviated from Whitley, the articles most commonly collected at different ages are given.

TABLE XXXIII.—OBJECTS COLLECTED BY CHILDREN
Seven Years and Under.

Boys	Girls
Marbles	Funny papers
Coupons	Samples of school work
Old magazines	Paper dolls
Small boxes	Small boxes
Buttons	Rubber bands
Eleven Years	
Coupons	Coupons
Marbles	Letters received
Stamps	Old magazines
Funny papers	Beads
Rubber bands	Samples of school work
Fourteen Years	
Coins	Letters received
Coupons	Photographs
Marbles	Samples of school work
Stamps	Beads
Samples of school work	Pictures
Eighteen Years	
Theater programs	Letters received
Letters received	Old magazines
Photographs	Samples of school work
Badges	Small pictures
Old magazines	Photographs

Source: WHITLEY, M. T. Children's interest in collecting. *J. educ. Psychol.*, 1929, 20. Condensed from table on pp. 253-254.

In Fig. 46 are shown graphically the favorite collections of children.

Adolescent Collections.—During adolescence, the articles collected are of a more personal type than in childhood and are related to the adolescent's personal interests. Collections include pictures of favorite movie actors and actresses, especially autographed ones; sports news and

pictures of favorite sportsmen; nature specimens, as butterflies, leaves, or shells; post cards from foreign lands; and other articles that happen to be in favor with the adolescent at that time. From early in the adolescent years through college, autograph books and "character books" containing spaces to be filled in by the adolescent's friends with information concern-

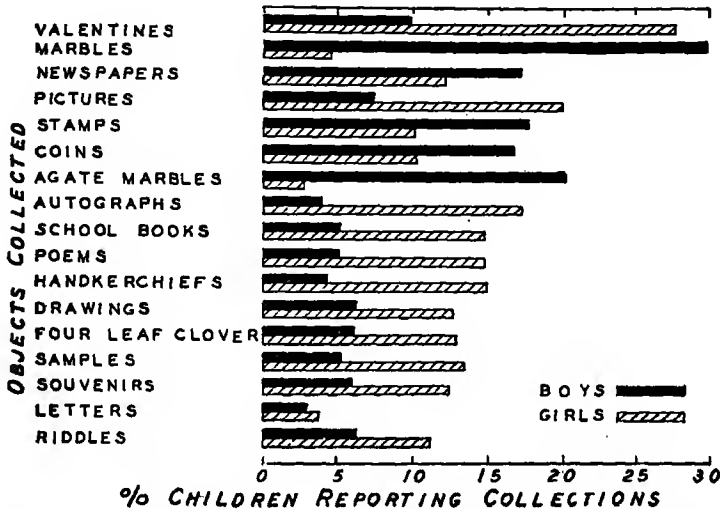


FIG. 46.—Objects most frequently collected by children age nine to sixteen. (Based on data of Frank Boone as reported by P. A. Witty and H. C. Lehman, *Further studies of children's interest in collecting*. *J. educ. Psychol.*, 1930, 21. From F. K. Shuttleworth, *The adolescent period*. *Monogr. Soc. Res. Child Developm.*, 1938, 3, No. 3.)

ing their "favorite" books, flowers, colors, sports, games, plays, cities, studies, and movie actors are popular media for collections.

2. GAMES AND SPORTS

Games of Babyhood.—Simple games, generally referred to as "mother games" because they are more often played with the mother than with any other person, begin to make their appeal during the second half of the first year. Finger play, patacake, peekaboo, hide-and-seek (behind furniture, a piece of cloth, or merely a hand), pigs-to-market, mirror play, and similar games, passed down from one generation of babies to another, seem to have a universal appeal. By the time the baby can walk, he gets keen enjoyment from hiding from others to see if they can find him.

Games of Childhood.—In early childhood, around the fourth or fifth year, the child becomes interested in the *neighborhood games*, played with other children in the neighborhood. These are of the *undefined-group* type, in which any number of children can take part. One child may organize the game and get the others to play with him, or the game may be

organized by an older child or an adult. In these games, the children copy one another and follow definite orders from the leader. Typical games of this sort are the ring games, cat and mouse, going-to-Jerusalem, puss in the corner, blindman's buff, advancing statues, hide-and-seek, and cops and robbers.

By the age of five, the child plays games to test his skills, such as walking on street curbs, walking on a crack in the pavement, jumping down steps, hopping on one foot, skipping, jumping rope, bouncing balls, or playing jacks. These are of a lower social organization than *neighborhood games* because they are individual rather than group and because their competitive element is of relatively little importance.

Games of the Gang Age.—By the age of ten or eleven years, games become largely competitive in spirit. Solitary play is abandoned, and the typical neighborhood games which reigned in favor earlier give way to *team, pair, or double-pair games*. Interest is now concentrated on skill and excellence. At first, the play is largely individual, with little cooperation with the other players. The child is not a good team player at first because he wants to dominate the play instead of limiting his efforts to his own role. Gradually, however, he learns to cooperate with the other players and, as a result, has more enjoyment. By the time he reaches adolescence, the typical child is a good team player, in that he can cooperate with the other players and adhere strictly to rules.

TABLE XXXIV.—PLAY INTERESTS BEFORE, DURING, AND AFTER PUBERTY

Play activity	Age groups, years				
	12	13	14	15	16
Cops and thieves.....	100	108	61	22	15
Run, sheep, run.....	100	113	74	38	6
Follow the leader.....	100	91	54	44	15
Tag.....	100	87	57	52	18
With marbles.....	100	91	59	36	19
With electric trains.....	100	77	53	23	6
Spin tops.....	100	72	37	23	14
Fly kites.....	100	83	43	27	14
With meccanos.....	100	100	63	40	19
Walk on stilts.....	100	80	62	47	17
With bows and arrows.....	100	84	49	31	13

Source: FURFEY, P. H. Pubescence and play behavior. *Amer. J. Psychol.*, 1929, 41, 109.

In a study of a troop of Boy Scouts and a pack of Wolf Cubs, Furfey (1926) found that few boys below the age of eight were interested in joining the clubs, while after fourteen, there was a marked falling off in

club membership, caused by loss of interest in play of this sort. He (1929) traced the decline of interest in gang-age games which takes place at puberty and found a marked falling off after thirteen years of age when, in the average boy, puberty changes make their appearance. This decline is well illustrated in the accompanying table, in which are given the percentages of boys who showed an interest in playing different games before, during, and after puberty.

A study of this table will reveal that while all the boys at twelve years of age, and nearly all at thirteen years, showed an interest in gang-age games, there was a marked decline of interest after that. By the time the boys were sixteen years old, very few showed an interest in games of this type.

Games in Adolescence.—Adolescence is the age of *team games* and *sports* of all types. Baseball, basketball, football, volley ball, tennis, and gymnasium work are extremely popular. These involve the expenditure of physical energy as well as keen competition regulated by strict rules. Toward the end of adolescence, when the leisure time for play is limited, owing either to the necessity of working for a living or to increased pressure in college or professional training schools, the adolescent spends less and less time on sports as an active participant. He selects those sports in which he excels and concentrates on them, rather than attempting to take part in every sport offered by the school or college.

With the decline in interest in sports comes an increased interest in *games of intellect*, such as riddles, puzzles and guessing games, card games, and games of chance. These, like sports, are highly organized and regulated by strict rules, but they involve relatively little expenditure of energy. At first, these games have simple rules and can be played alone as well as with other players. Gradually, however, they become increasingly complex in structure and require a specified number of players.

3. AMUSEMENTS

"Amusement" is the name applied to that form of play in which the individual is a passive participant and derives enjoyment as a spectator, from observing the activities of others. This type of play is especially well suited to times of the day when the child is tired out from active play or to those children whose everyday routine requires so great an expenditure of energy that they are too tired to play actively during their leisure time. As the child grows older and has more responsibilities, amusements occupy more and more of his leisure time.

Since reading, radio, and movies are the three most popular forms of amusement, they will be discussed in detail in the following sections as examples of this type of play.

Reading.—From early in the first year, little babies like to be sung to. They enjoy the rhythmic sounds of lullabies and nursery rhymes, sung or recited in a singsong voice. Around the age of two, they like to look at picture books containing large pictures of people, animals, and familiar household objects printed in bright colors. While looking at the pictures, they enjoy being told simple stories about them.

Early Reading Interests.—Story books which have been read to him so often that he knows them almost by heart and picture books appeal mostly during the childhood years. As many of the desires of the child center around food, stories dealing with fairy-tale land where houses are made of gingerbread and peppermint sticks naturally have a great appeal. The Mother Goose jingles are loved by all children because of their easy swing. Next in popularity are the simple fairy and nature stories. Because of the child's belief in animism, stories which deal with animals that behave like human beings are very popular.

Reading Interests of Late Childhood.—The enjoyment the older child derives from reading is for the most part due to the satisfaction of the spirit of adventure, so strong at that age. As the child is carried into an imaginary world created for him by the book, he imagines himself doing the things he would like to do but which, in everyday life, he may not be able to do. At the ages of six and seven years, the main interest in reading lies in stories about nature, the wind, birds, trees, and flowers. There is a beginning of interest in fairy tales, but these must be short, simple, and for the most part in dialogue form. Any book for this age must contain more pictures than reading matter.

The most favored reading for the eight-year-old child is fairy tales. The fantastic, imaginative element of these stories appeals to the child at this age. Rather closely related to the interest in fairy stories is the interest in stories of other lands, especially when they center around children. By the age of nine, interest in fairy tales begins to lag, owing to the fact that training in schools makes it increasingly difficult for the child to believe in fairy-tale elements. This is especially true of boys whose reading interests at nine shift to stories of boy life, mainly of the Boy Scout type.

Toward the end of childhood, there is generally a rage for reading, which places reading high among the most favored play activities. This is especially true of girls. It is quite usual for boys and girls to read one or two books for pleasure every month.

Preadolescent Reading Interests.—Terman and Lima (1927) found that the eleven-year-old is interested mainly in tales of adventure and mystery. Science and invention are popular reading topics for boys, while home and school life are topics more popular with girls. Girls retain an interest in fairy and animal stories, but boys at this age have entirely outgrown their

interest in this type of book. At the age of twelve years, the climax of the "reading craze" is reached, an age which coincides with the beginning of preadolescence, when boys and girls are beginning to show a desire for isolation.

Because of the beginning of a hero-worship tendency, books of legendary or historical heroes, as well as biographies of great men and women, thrill the twelve-year old. Books about invention, athletics, and adventure are very popular with boys, while girls show a preference for books relating to home, boarding-school or college life, adventure, stories written for boys, nature stories, and Bible stories. At the age of thirteen, these reading interests become intensified, but few new reading interests develop. Girls show their first interest in poetry and drama at this time, while for boys, the reading that appeals most is similar to that of the preceding year.

Adolescent Reading Interests.—By the age of fourteen years, specialized reading interests appear and periodicals are more favored than books. Fairy tales and stories of the make-believe world, so popular in childhood, are replaced by emotional fiction and stories of a more adult type. In the case of boys, stories of athletics, heroes, adventure, and invention prove to be most popular. To a lesser degree, biographies, travel, and history, as well as classics of other eras, appeal to the adolescent boy. Girls of fourteen, Terman and Lima (1927) found, are more mature in their reading interests than are boys, and they prefer adult books, especially sentimental novels.

Because of the pressure of school work and athletics, reading for pleasure begins to suffer by the age of fifteen years. Poetry and romances generally monopolize the girls' reading interests, while boys show preference for history and books relating to their own hobbies. By the age of sixteen years, Terman and Lima found, mature reading habits, differing little from those of adults, are well established.

Jordon (1926) analyzed the reading interests for nearly 5,000 high-school students and arranged their choice in certain classes as given in Fig. 47, presented on the following page.

From the data presented here, it is apparent that, during the adolescent years, books and magazines dealing with adventure are most popular with boys, while in the case of girls, fiction stands first.

Comic Strips.—The comic strip is a cartoon story in which the story element is less important than the pictures. Relatively few of the comic strips published today are humorous. Most of them relate to adventure rather than to comedy. The marked popularity of reading comic strips is shown by the fact that, in America, there are over 1,000 comic strips which appear in a large percentage of our daily and Sunday newspapers. Most children, as well as a large number of adult readers, prefer them to

all other parts of the papers. Lehman and Witty (1927a) found that boys and girls from eight to fifteen years of age engaged in looking at funny papers more commonly than any other form of play activity. Interest in looking at comic strips begins to wane to a certain extent during adolescence, but it remains popular even when new reading interests appear.

The type of comic strip that children like is subject to individual differences, but there are certain types of preference that appear at different ages. Reports by children of grades four to six, studied by Hill

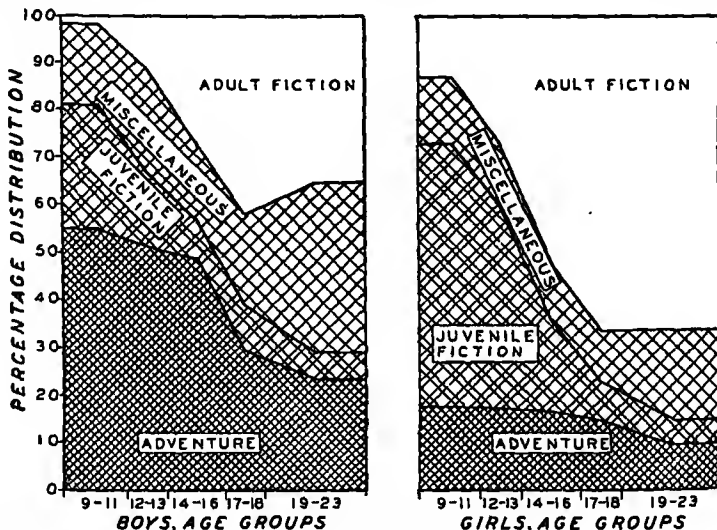


FIG. 47.—Percentage distribution of best liked books classified according to type, by age groups and sex. (Based on data of A. M. Jordon, *Children's interests in reading*. New York: Teachers College Contributions to Education, 1921, No. 107. From F. K. Shuttleworth, *The adolescent period*. Monogr. Soc. Res. Child Developm., 1938, 3, No. 3.)

and Trent (1940), showed what comics they liked best and why. According to them, the children liked the comic strips because they are exciting, mysterious, and thrilling, full of action and fighting, tell interesting stories, and present characters with bravery, strength, beauty, and unfailing ability to master difficulties. Humor was given in only 17 per cent of the explanations as a reason for liking comic strips. In the case of girls, the element of romance and family life appealed. Comic strips thus, like the reading of books, satisfy the child's longing for adventure.

Movies.—Attending moving pictures, theatres, and concerts is a popular form of play during late childhood and adolescence. In communities where amusements of this type are limited to moving pictures, nearly every child attends moving-picture shows occasionally, some as often as once a week. According to Lehman and Witty (1927), at the

ages of eight and nine years nearly one-half of the town children they questioned attended movies, while at the age of twelve years, two-thirds of the town girls did so.

Movie Preferences in Childhood.—Movie interest parallels reading interest, except that comedy plays a greater role in movies than in reading. Miller (1930) found the motive for attending movies is "thrill." Anything that involves adventure, mystery, or romance offers a "thrill" which everyday life does not give. Seagoe's (1931) study of children from grades one to eight revealed that 53.3 per cent of the children preferred going to movies to reading a book or playing a game. The preferences for different types of movies for children of different ages were found to be as follows:

AGES SIX TO NINE YEARS.—Comedies and cartoons are the favorites. They like to see children and animals as actors. They want the heroes to be active and the heroines pretty.

TEN TO TWELVE YEARS.—At this age, boys and girls want adventure films, and they are now less fond of comedy.

Movie Preferences in Adolescence.—Attending moving pictures is one of the favorite pastimes of the adolescent years. Both boys and girls of this age attend moving pictures often enough to make them an important factor in their lives. Psychological studies have shown that boys and girls have definite preferences for the types of pictures and performances they wish to see. They are more critical of the pictures, especially the too sentimental love stories, and are likewise extremely critical of the actors and actresses.

Moving-picture preferences of high-school students have been investigated by Sullenger (1930). The percentage of adolescents at each age

TABLE XXXV.—MOVING-PICTURE PREFERENCES OF HIGH-SCHOOL STUDENTS

Type	Percentage of preferences			
	Grade 9	Grade 10	Grade 11	Grade 12
Mystery.....	40.2	35.5	35.7	30.1
Love.....	15.8	17.3	18.3	23.1
Western.....	12.2	5.7	6.2	2.3
War.....	10.3	12.4	11.2	9.9
Comedy.....	9.8	11.3	10.9	8.0
Melodrama.....	3.8	4.7	6.7	11.1
Educational.....	2.9	3.5	3.4	3.5
Tragedy.....	2.4	3.7	3.3	5.2
Society.....	1.9	2.0	2.9	3.3
Sex.....	0.83	1.4	1.4	3.3

Source: SULLINGER, T. E. Modern youth and movies. *Sch. & Soc.*, 1930, 32, condensed from table on p. 460.

showing preferences for different types of pictures is given in the accompanying table.

It is apparent from the figures just given above that mystery and love themes stand first in popularity throughout the high-school years, while Western pictures and comedies, so popular in late childhood and during the freshman year of high school, lose their popularity as the adolescent grows older.

Sex Differences in Movie Preference.—As is true of play of all types, sex differences in movie preference begin in childhood and persist throughout adolescence. These differences parallel the sex differences shown in reading interests. Boys, on the whole, prefer more thrill and excitement than do girls, whose preference is for romance. Sex differences in movie preference during adolescence were summarized by Sullenger (1930) in the table given below:

TABLE XXXVI.—SEX DIFFERENCES IN MOVING-PICTURE PREFERENCES

Type	Percentage of preferences	
	Boys	Girls
Mystery.....	42.2	32.0
War.....	17.3	6.0
Comedy.....	11.7	8.7
Western.....	10.8	5.3
Melodrama.....	5.2	6.2
Love.....	4.2	29.5
Tragedy.....	4.6	3.2
Educational.....	3.5	4.2
Sex.....	2.08	1.1
Society.....	2.0	3.8

Source: SULLENGER, T. E. Modern youth and movies. *Sch. & Soc.*, 1930, 32, 460.

This shows that boys during adolescence show a slightly greater preference for mystery, war, comedy, and Western pictures than do girls, while girls, on the other hand, show a markedly greater preference for movies with a love theme than do boys. In all the other themes, the interests of the two sexes were found to be almost identical.

Influence of Movies.—The influence of movies on both children and adolescents is great. In the case of children, movies have a pronounced emotional effect in that they often frighten the child, thus causing nightmares or day-time fears that are difficult for the adult to understand unless he knows the circumstances that have given rise to them. Over-excitement and nervous tension, which so commonly follow moving-picture attendance, lead to sleeplessness and irritability. Many children

suffer from eye strain and general fatigue as a result of attending movies in the late afternoon or evening following a busy day in school or at play.

To measure the influence of movies on children's attitudes, Thurstone (1931) showed school children two films, *The street of chance*, which described the life of a gambler, and *Hide out*, which dealt with prohibition. He measured the effect these pictures had on the children's attitudes by having them check questionnaires before and after seeing the pictures. He found that the film *Hide out* did not have any measurable effect on their attitudes toward bootlegging or prohibition, while the film *The street of chance* made the children more severe in their judgment of gambling than they were before seeing the film. Using a similar technique, Peterson and Thurstone (1932) studied the effect that the film *Four sons* had on children's attitudes toward Germans and war. They found a shift in attitude toward Germans which made the children more friendly toward them, as well as a slight shift toward pacifism. They concluded that the "social attitudes of children are affected in a measurable way by motion-picture films."

The adolescent is not only interested in movies but movies have a great influence on the adolescent's life. This is especially true in the case of girls. The adolescent writes "fan" mail to favorite actors and actresses, adorns the walls with autographed photographs, reads movie magazines and gossip sheets, and copies the clothes, hair styles, gait, mannerisms, and speech of a favorite star. Of even more serious consequences, the adolescent's ideals of right and wrong are markedly influenced by the moving pictures he sees, as will be stressed in the chapter on Moral Development.

The Radio.—A new source of amusement for children and adults is the radio. In fact, during late childhood and adolescence, it is one of the most popular, if not the most popular, form of indoor amusement. In most cases, it is preferred to the phonograph, reading, and all types of indoor games, such as card games and puzzles. The radio has, in the last decade, come within a price range that makes it possible for families in the lower income brackets to have at least one in the home. As a result, there are relatively few children, especially in the urban districts, who cannot enjoy this form of amusement either in their own homes or in the homes of their friends.

Studies of time spent in listening to the radio show that children spend from 1 to 3 hours daily in voluntary listening. Adolescents, if they have radios of their own or access to the family radio, keep the radio going constantly while they are in the house. They even insist upon having it turned on while they are studying, on the grounds that they can study better. While it may appear to the casual observer that adolescents are not really paying attention to what they hear, they are, as evidenced by

TABLE XXXVII.—TYPES OF PROGRAM CHILDREN WOULD LIKE TO HEAR ON THE RADIO

Type of program	Number of boys reporting	Percentage	Number of girls reporting	Percentage	Total number of children reporting	Percentage
Dramatizations:						
Plays.....	458	23	267	14	725	19
Mystery stories.....	202	10	213	12	415	11
Adventure stories.....	198	10	175	6	373	8
Exciting stories.....	124	6	80	4	204	5
Cowboy stories.....	110	6	2	...	112	3
Detective stories.....	39	2	16	1	55	1
Ghost stories.....	31	2	20	1	51	1
Murder and gangster stories.....	25	1	9	...	34	1
Tragic stories.....	7	...	17	1	24	1
Love stories.....	2	...	21	1	23	1
Serial stories.....	12	1	10	1	22	1
Sea stories.....	21	1	...	...	21	1
Children's programs.....	4	...	15	1	19	1
Criminal and prison stories.....	16	1	2	...	18	
War stories.....	13	1	1	...	14	
Fairy tales.....	1	...	12	1	13	
Children's stories.....	4	...	7	...	11	
Music and songs:						
Music (general).....	131	7	261	14	392	10
Songs and singing.....	95	5	217	12	312	8
Orchestra music.....	21	1	46	2	67	2
Jazz music.....	21	1	30	2	51	1
Dance music.....	4	...	47	3	51	1
Operas.....	3	...	17	1	20	1
Concerts.....	1	...	17	1	18	
Classical music.....	2	...	16	1	18	
Band music.....	9	...	5	...	14	
Piano recitals.....	2	...	9	...	11	
Humor:						
Jokes.....	116	6	115	6	231	6
Comedians.....	102	5	79	4	181	5
Funny programs.....	91	5	86	5	177	5
Funny stories.....	8	...	21	1	29	1
Information:						
Current events.....	26	1	38	2	64	2
History.....	30	1	15	1	45	1
Addresses.....	8	...	15	1	23	1
Miscellaneous:						
Sports.....	32	2	2	...	34	1
Wrestling and fights.....	21	1	2	...	23	1
Games.....	10	1	12	1	22	1
Total.....	2,000	100	1,857	100	3,859	100

Source: EISENBERG, A. L. *Children and radio programs*. New York: Columbia Univ. Press, 193 p. 93. Quoted by permission.

the fact that they have definite preferences for certain programs an object strenuously if other members of the family insist upon listening to programs that they dislike.

Program Preferences.—Until 1929, the only radio programs for children were bed-time stories. Since that time, however, programs designed primarily for children have become so numerous that at almost every hour of the day, when children are free to listen to the radio, there are several programs that appeal to children of different ages from which they may choose those that appeal to them. Several investigations have been made to determine what types of program are favored by children. Two of these will serve to illustrate the findings. One relates to a large group of children in the metropolitan area of New York City and the other, children from Washington, D.C., and Fairfax County, Virginia.

Eisenberg (1936) studied the program preferences of nearly 4,000 children in New York City, by means of questionnaires, answered by the children and their parents, personal interviews, and compositions written by the children themselves. In Table XXXVII are given the number and percentage of boys and girls who said they would like to hear programs of different types.

TABLE XXXVIII.—RELATIVE PREFERENCES FOR PROGRAMS OF EACH TYPE

Program type	Percentage of first choice programs for each program type	
	Boys	Girls
1. Classical and semi-classical music.....	4	8
2. Religion.....	0	0
3. Dance, popular and novelty type.....	15	13
4. Comedy and variety.....	36	25
5. Detective, crime and mystery programs.....	13	2
6. Drama: general historical, romantic.....	14	32
7. Travel and adventure.....	0	0
8. Children's programs (not otherwise listed).....	8	15
9. National, public and civic affairs.....	0	0
10. News.....	7	2
11. Sports.....	1	1
12. Adult programs (including educational, labor, agriculture)...	2	2
	100	100

Source: CLARK, W. R. Radio listening habits of children. *J. soc. Psychol.*, 1940, 11, 135.

The programs that ranked highest in popularity proved to be plays, mystery stories, music (general), adventure stories, songs and singing, and jokes. A surprisingly small number of children said they liked programs of detective, ghost, murder, gangster, tragic, love, funny, and sea stories; jazz, dance, and opera music; information, and sports. The only

sex difference worthy of note was in the case of the girls' greater preference for general music, songs and singing, and dance music and the boys' greater preference for plays and adventure stories.

Clark's Study.—A questionnaire study of the program preferences of urban and rural children, nine to eighteen years old, in Washington, D.C., and Fairfax County, Virginia, was made by Clark (1940). The percentage of first choice for programs of different types is given in the accompanying table.

The children in this study showed a marked preference for comedy and variety programs, and for drama, whether general historical or romantic. This contrasts markedly with Eisenberg's findings in his study of New York City children. Boys and girls showed a difference, not in the amount of time spent in listening to the radio, but in the type of program they preferred. Girls had a broader range of program interests than did the boys. The percentage of preference for drama, classical and semiclassical music, and children's programs was greater for the girls, and for comedy and variety, detective, crime, and mystery programs, greater for the boys. The reasons they gave for disliking certain programs were "lack of interest," "silly," and "childish."

PETS

All children like to play with pets. Even little toddlers enjoy romping with a tame kitten or puppy. As the child grows old enough to want playmates to share his play time, he finds a pet, especially if the pet be a dog or cat, a satisfactory substitute when no real playmates are available. During the preadolescent period, when the child's feelings are easily hurt and when he feels that everyone misunderstands him, pets are especially satisfactory playmates.

Burk (1900) and Lehman (1928) have studied the child's interest in playing with pets as a type of play activity. Burk found that interest in dogs and cats increases rapidly from seven to fourteen years, with a peak around the twelfth year. Boys show a marked preference for playing with dogs rather than with kittens, and the same preference is shown by girls, only in not so marked a manner. The girl's interest in cats, Lehman found, culminates sooner than her interest in dogs.

FACTORS INFLUENCING PLAY

Not all children play alike. While it is true that the play interests of the child conform more or less closely to a pattern, there are, however, variations which may be traced to one or more of the following factors:

1. **Health.**—It is a well-known fact that healthy children play more than sickly ones. The healthier the child the more surplus energy he

has, over and above the requirements for living, and hence the greater his energy for play. Reports from public-health nurses, charity workers, and teachers show that underfed and undernourished children are much less playful and they care less about the toys given to them than do healthy children.

During the preadolescent years, the effect of health on play is especially pronounced. At that time, the individual's entire play program changes. From interest in games and sports of all types, involving strenuous physical exertion and a number of play companions, the preadolescent turns his attention to reading, card games, and the quietest forms of sports which involve few playmates. On the whole, his play is solitary rather than social.

2. Intelligence.—As early as the first year, the child's play is greatly influenced by intelligence. Bright babies are more active and playful than dull ones, and their play shows greater ingenuity. As the baby passes into the second year, marked differences are apparent in the play of bright and dull babies. The bright child rapidly advances from sensory to imitative play, and soon the element of imagination is apparent. This is not true of the play of dull children. Month after month their play shows little change, and it is soon obvious that they are lagging behind other children of the same age. The older they become, the more apparent is this gap.

With increased mental age, there is a lessening of the number of play activities. There are also fewer play activities of a social type and more forms of solitary play, especially reading. At the time when competitive games and sports are very popular, the bright child shows far less interest in them than does the child of lower intellectual level. Likewise, his interest in competitive sports as a spectator is generally mild. Interest in intellectual games, such as card games, guessing games, and games of chance is, on the other hand, more pronounced in the individual of very high intelligence.

In a study of two groups of fifth-grade children, the first with a median I.Q. of 120.5 and the second with a median I.Q. of 83.5, Boynton and Ford (1933) found the bright children averaged 45 to 50 minutes a day more in play than did the dull children and nearly an hour a day more in mental recreation. The same versatility of play interests was noted by Lehman and Witty (1927, 1927c, 1928) in children with I.Q. scores above 140 as was noted in children of average intelligence, but there was a difference in the type of play activity engaged in. The gifted children were more solitary and less social in their play interests; they spent more time in activities involving reading; they enjoyed humor more, such as looking at comic strips, reading jokes, and funny sayings; and they participated in fewer activities of a motor type that involved vigorous physical

play than did the average children. The gifted child, Terman (1925) found, shows less preference for competitive games than the average child and shows a preference for playmates older than himself.

When a child's play is conspicuously different from that of other children of the same age, Hollingworth (1926) found, the child's intelligence diverges far from the average. Children tend to play with others of like mental age. Moderately gifted children are accepted as playmates by children slightly older than they, but children with I.Q. scores above 170 or 180 have noticeable difficulty in play with other children. Hollingworth gives an interesting example of this in the case of a boy with an I.Q. of 187 who was unpopular with children of his age because he insisted upon reorganizing play into a complicated pattern. He was not accepted by children of his own mental age, which was twelve years, because he was regarded by the twelve-year-olds as "too little to play" with them. He therefore compensated for lack of playmates by collecting, reading, and arithmetical calculations.

The role played by intelligence in the play of the child is especially noticeable in reading. Early interest in reading and ability to read are found in children with high intelligence-quotient scores. Very bright children at every age spend more time in reading than do children of average intelligence, and they have a wider range of reading interests. The type of reading they prefer also differs from that of the average child. Gifted children enjoy reading dictionaries, atlases, encyclopedias, science, history, biography, travel, folktales, informational fiction, poetry, and drama. Fairy tales are disliked and detective stories preferred above crude adventure and mystery. Emotional fiction appeals less to gifted than to average children, and an interest in romance occurs even before the child is ten years old (Hollingworth, 1926; Terman, 1925).

3. Sex.—During the early years of life, there is no real difference in the play activities of boys and girls. Given the same environment and the same toys, no really significant difference would be apparent until the gang age. But inasmuch as there are, in most homes, different environments and different toys for the two sexes, differences in play begin to appear at an early age. Girls are given play equipment which encourages make-believe play, such as housekeeping materials and materials for creative play, as crayons, paints, clay, and blocks. Boys, on the other hand, are encouraged to shun the "sissy" toys and are taught to play with more masculine playthings, as soldiers, wagons, balls, blocks, wood, and all materials needed for construction. Boys, on the whole, engage in more vigorous play than girls.

The most pronounced sex differences in play come during late childhood, especially between the ages of $8\frac{1}{2}$ and $10\frac{1}{2}$ years, according to Lehman and Witty's (1927*c*) report. The play of girls is less strenuous

and active but more imaginative than that of boys at that age. Girls have, however, a larger repertoire of play interests than have boys. They do not have as keen an interest in competitive play as boys, nor are they as keenly interested in play activities that require mechanical ability and motor skill.

Sex differences in reading interests, studied by Terman and Lima (1927), showed a preference for stories of adventure and mystery in the case of boys and stories of home and school life in the case of girls. Only a slight sex difference in interest in looking at the Sunday "funny paper" was found by Lehman and Witty (1927a). Terman's (1925) study of gifted and average children showed that boys scatter reading over a larger range than girls. Girls, on the other hand, are apt to read the same books two or more times. Boys read three times as many books on adventure or mystery as girls, while girls read five times as much emotional fiction as boys.

4. Environment.—Children from poor environments play less than do children from better environments. This is due, in part, to a difference in health. But, to a large extent, it may be traced to the fact that children from poor environments have fewer toys, less time, and less space in which to play than do those who come from economically better environments. While it is true that there are often more play companions available in the poorer environments, this factor alone is inadequate to compensate for the other factors mentioned.

Comparison of the play of town and country children has shown some interesting differences. Because of the geographic isolation of rural children, team games are difficult to organize. As most rural children have few toys and little play equipment, imagination is used to supplement deficiencies in material. Likewise, the typical rural child is expected to help with the work of the farm or home and consequently has less time for play than the typical city child.

Lehman (1926) compared the play of town and country children and found that rural boys under 10½ years of age engaged in fewer activities than did boys of the same age who lived in town. After 10½ years, the former engaged in a larger number of activities. This greater diversity of interests arises from the fact that rural life offers certain recreational interests not found in cities. Country children climb porches, trees, fences, and posts more than do town children, and they also sing and whistle more.

5. Amount of Leisure Time.—The amount of leisure time the child has determines not only the amount of time he plays daily but also the type of play engaged in. With limited time, the child engages in play that can be completed in the time available, and, when limited free time is the result of duties imposed upon him, he is apt to be tired when play-

time comes. He consequently engages in play activities that require only a small expenditure of energy.

The amount of leisure time depends primarily upon the economic status of the family. Fox (1934) reports that in the case of children living in a residential suburban community, those of the higher economic level had few home duties and little or no work outside of the home. The children from poorer homes, on the contrary, had less time for leisure activities because of the duties imposed upon them. In the country, children generally have less leisure time than city children of the same economic strata, because they are expected to help their parents.

6. Play Equipment.—The amount and type of play equipment available have a marked influence on the play life of the child. Given certain types of toys, the child will use them, and his play activities will thus be influenced by them. Should the play equipment, for example, favor constructive play, as in the case of blocks, sand, or hammer and nails, the play will, of course, be primarily constructive. Predominance of dolls, household equipment, or soldiers puts emphasis on imaginative, make-believe play. Similarly, as children grow older, play equipment for team games encourages them to play such games, while lack of equipment necessitates finding other outlets for their play interests.

Johnson (1935) found that among young children less bodily exercise and more play with sand and dirt, more games, more undesirable behavior, and a greater number of social contacts occurred when there was a reduction of play materials at the school playgrounds. This encouraged the children to become very resourceful in all situations. When, on the other hand, the children had more equipment, they engaged in more bodily exercise, showed less social and also less undesirable behavior. Thus, individual endeavor, Johnson found, is encouraged and social play is discouraged by large amounts of play material.

CHAPTER XI

DEVELOPMENT OF UNDERSTANDING

At birth, as James (1890) pointed out many years ago, the child's consciousness is a "big, blooming, buzzing confusion." He has no understanding of his environment or of what he observes around him. Gradually, as a result of maturation and learning, the child begins to understand what he observes, and consequently his environment begins to be meaningful to him. But, as no two children have the same intellectual abilities or the same experiences, no two individuals can be expected to have the same understanding of an object or situation. As a result, each child interprets his experiences in terms of memories of previous experiences.

CHILDREN'S CONCEPTS

The child's concepts of the world in which he lives, which consist of the ideas he associates with objects or situations, increase with experience and with his ability to perceive relationships between new and old situations. The more readily he can associate new meanings with old experiences, the more meaningful these old experiences become. Development of the concept of *orange*, for example, comes from the association of new meanings with the original meaning of an orange as a fruit. When the child learns that a specific color is called *orange*, that a type of tree is called *orange*, that a drink is called *orange* juice, and that a certain kind of flower is called *orange* blossom, he gradually understands *orange* to mean more than a fruit, as he had originally thought of it. His concept of *orange* is broadened and developed through new experiences associated with old experiences.

Children's concepts are difficult to study, for three reasons. (1) Many of the child's concepts have meanings so different from those of adults that the adult is apt to overlook them completely. To a child, for example, "doggie" may mean all small animals that walk on four legs, have a tail, and soft fur. The child is including, in this concept, cats, baby bears, and many other small animals seen in a zoo. To the adult, on the other hand, the concept of dog is specific, and as a result the adult does not realize the child's concept is broader and more general in scope. (2) Many of the child's concepts exist in different degrees of perfection and are not formulated well enough for the child to be able to express them in terms understandable to an adult. (3) In young children, and also in older children with limited vocabularies, many concepts exist in

the child's mind which cannot be expressed in verbalized form. The result is that it is impossible for the adult to know just what these concepts are or to be able to study them in an objective way.

Observations of babies and young children have shown, however, that concepts develop rapidly during the early years of life. The baby's recognition of familiar people and objects in his environment is accompanied by pleasure responses, while his recognition of people and objects as new and strange is accompanied by fear and withdrawal responses. The way the baby responds to the sight of his bottle, to familiar toys, or to outdoor clothing, all indicate that he understands what they mean. Even though he cannot, at that early age, express in verbal form what

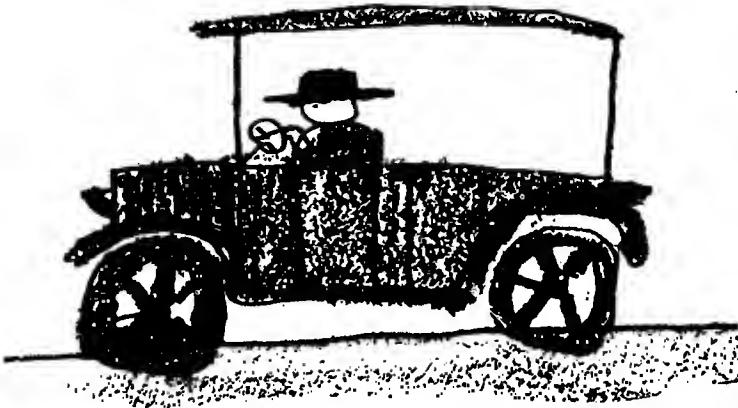


FIG. 48.—What a child perceives as shown by the details he stresses in drawing. Drawing of a car by a boy of 6 years 1 month, with an I.Q. of 115. (From J. J. Thomson, *Children's drawings: an experimental study of perception*. Unpublished Master's Essay, Columbia University Library, 1933.)

the meanings are, and even though they are probably vague and indefinite in his mind, there is nevertheless ample evidence that there is a beginning of understanding on the young child's part.

General vs. Specific Concepts.—In the development of meaning, the young child first responds to the *total situation* rather than to any one part of it. He does not notice details as quickly as he observes the object as a whole. The result is that objects or situations which have elements in common are responded to as if they were the same, and the young child develops concepts of a general type in which meanings are vague and unformulated. With experience, the child distinguishes partial elements of objects and groups together those that have features in common. In this early type of classification, the object's function and structure play a dominant role in the child's understanding of its meaning.

With increase in maturity, there is a tendency for the child's concepts to become more specific. No longer is the concept of *toys*, for instance,

vague and indefinite to the point that it is applied to any object with which the child plays. Rather, it becomes specific and is applied only to playthings as such, objects which have no other function and are used for no other purpose.

A study of the drawings of children, $4\frac{1}{2}$ to $8\frac{1}{2}$ years, by Hurlock and Thomson (1934) revealed some interesting facts about children's concepts. The children were asked to draw eight commonplace objects, as a man, girl, house, dog, tree, automobile, flower, and boat. No restrictions were placed on the procedure, and the children were free to draw these objects as they wished. In that way, it was possible to determine the meanings that these objects had for the children.

The children's drawings offered some interesting data about concepts. It was found that with increase in age there was a tendency to perceive the specific rather than the general. Likewise, as children grow older, they perceive more details and associated objects than they formerly did (see Fig. 48) and there is a decided increase in the accuracy of these perceptions. In most instances, some background was given with the drawings which shows that children have a tendency to perceive things as units, even though certain details stand out in a more clearly defined manner than do others.

HOW CHILDREN PERCEIVE MEANINGS

A study of how children perceive the environment in which they live, and what meanings they associate with what they see, hear, smell or taste, will show what understanding they have at different ages. Because of their limited knowledge and experience, it is apparent that they cannot perceive an object or situation in the same way as an older or more experienced individual would, even though their sense organs are equally well developed. Like an adult, they interpret new experiences in relationship to knowledge formerly acquired.

Children at first perceive things on their face value. They are unable to interpret what they observe except as it appears to them at the time. Any subtle meaning, not apparent at first glance, escapes them. This was well demonstrated in the experiment by Shaffer (1930), in which a study was made of children's ability to interpret cartoons, or symbolic drawings which are not meaningful in themselves but are significant of general concepts. Shaffer selected 17 cartoons from those used in an experimental course of study in history, geography, and civics for grades seven to nine. These he gave to children in grades four to twelve and found a pattern of response according to the age of the children. At first, the response was merely repetition of title or name of the cartoon, then description of the cartoon, later concrete interpretation, and in the oldest groups, abstract interpretation. There was a marked lack of

relationship between the percentage of abstract responses and the percentage of correct responses.

Total Impression vs. Analytical Approach.—It is difficult to tell whether children, especially young children, get more meaning from a total impression than from an analytical approach to a situation. Observations of children show that they perceive meaning, no matter in what position they view the object, as when they look at pictures in a book sideways or upside down. This would suggest that they perceive more meaning from an impression of the total object or situation than from an analytical approach to it. Newhall (1937) showed charts, on which were drawn concrete and geometrical forms, to children three to five years old. The procedure was to put on the table, before the child, five figures and then ask the child to indicate the figure on the table which corresponded to the figure on the chart on the wall. He found that children could identify familiar forms, a chair, horse, or candle, nearly as quickly and correctly when the pictures were shown upside down or in left-right reverse position as when presented in the normal position.

Animism.—Because of the young child's limited experiences and knowledge, he does not distinguish between living and inanimate objects. On the contrary, he believes, as do primitive peoples, that all objects have the same life qualities that one finds in the human being and are, therefore, *animate*. "Animism, or the tendency to ascribe consciousness to inert objects, is one of the outstanding characteristics of the young child's perception. As a result, his concepts are realistic, and consequently they are often faulty."

Piaget (1929) recognizes four successive stages in the animistic concepts of young children. In the first stage, when children are four to six years old, everything that is in any way active is regarded as conscious, even though it be stationary. Consciousness is attributed only to things that can move, in the second stage, which occurs between the ages of six and seven years. The sun and a bicycle, for example, are regarded as conscious, while a table or a stone, both of which are inert, are not. Between the ages of eight and ten, the third stage, an essential distinction is made between movement that is due to the object itself and movement that is introduced by an outside agent. Bodies that can move of their own accord, as the sun or wind, are looked upon as conscious, while objects that receive their movement from without, such as bicycles, are regarded as devoid of consciousness. In the fourth and final stage, which begins at the age of eleven years, consciousness is restricted to plants and animals, or to animals alone.

Russell (1940, 1940a) and Russell and Dennis (1939), in a study of animistic concepts of children, used a series of questions related to the animate or inanimate nature of 20 objects, such as a stone, knife, mirror,

comb, chair, dog, bird, tree, and grass. When these questions were given to children ranging in age from three to fifteen years, it was found that they could be classified in the four stages of concepts as suggested by Piaget. With increases in mental and chronological age, they were found to pass sequentially through the series of concept stages.

DEVELOPMENT OF MEANING

Development of meaning progresses rapidly during the early years of life. At first, the baby discovers the meaning of the objects in his immediate environment through *sensory exploration*. He looks, listens, and smells, tastes, and touches everything within his grasp. As a result, he observes meanings which, when fused with meanings previously observed, cause strange and unfamiliar objects to become familiar and no longer the source of mystery that they previously were. The more often he can observe an object, with short time intervals between the observations, the more quickly will it become meaningful to him. The baby comes to know the mother, for instance, more quickly than the grandmother, because of the more frequent opportunities to observe the former as contrasted with the latter.

Role of Motor Manipulation.—When motor coordination has reached a point in its development which enables the child to handle things at will, motor manipulation supplements the information formerly gained through sensory exploration alone. Through touching and handling objects, the child discovers qualities, such as smoothness, softness, or warmth, which could not be observed by looking at them alone. Too often, the "hands off" policy, which so many adults enforce, results in depriving the child of one of the most valuable sources of information that he has.

While it is true that, owing to lack of well-developed motor control, many little children are destructive in their desire to understand the meaning of objects that arouse their curiosity, this destructiveness is usually accidental rather than intentional. Given an opportunity to explore with adult supervision and aid, the young child will not only satisfy his curiosity with minimum destructiveness but will also discover more meanings than would be possible if left to his own devices.

Role of Questioning.—As soon as the child is old enough to put together words in a sentence, he begins to ask questions about things which arouse his curiosity. The "questioning age" begins around the third year and reaches its peak at the time the child enters school, at approximately six years of age. How important a role questioning will play in the development of understanding after that time depends to a large extent upon what success the child has in satisfying his curiosity in this way. He will unquestionably continue to use this method of

gaining information throughout the rest of his life, but how useful it is to him will depend upon the satisfaction he derives from it during the early years of childhood.

While it is true that the young child is motivated to use questioning primarily because of genuine curiosity, he also asks questions to check upon or to supplement the information he has gained through his own experimentation. In many instances, he is not satisfied with what he has been able to discover through his own experimenting, and he then tries to supplement what he has learned by questioning those whom he believes to be better informed than he. Questioning is also motivated

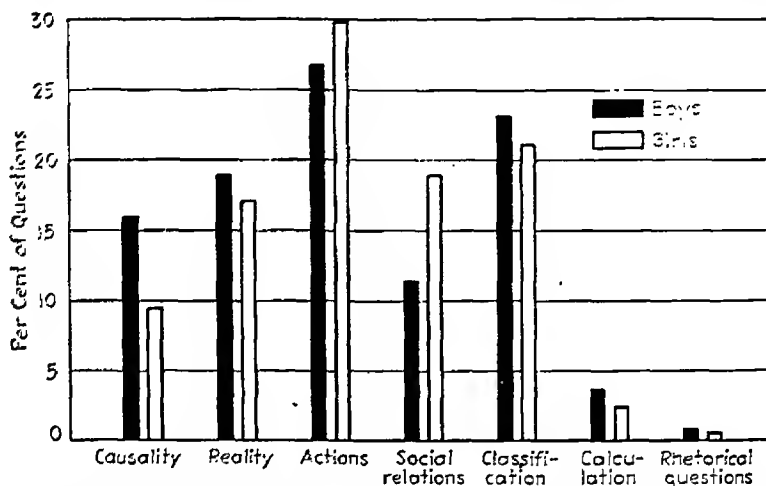


FIG. 49. Percentage distribution among the functional categories of questions asked by boys and girls. (From E. A. Davis, *The form and function of children's questions*. *Child Development*, 1932, 3.)

at times by a desire to attract and hold the attention of others rather than by genuine curiosity. If such be the case, the child shows little interest in the answers given to his questions, and more often than not he asks the same question several times.

Many biographical studies of young children refer to the "questioning age." Boyd (1926) found that 21.6 per cent of the 1,250 remarks of his daughter were questions. Brandenburg (1915) noted that 18 per cent of his child's conversations were questions at thirty-eight months, and 20 per cent, at fifty-two months. Studies of groups of children have shown the important role played by questioning in the early years of life. Smith (1926) reported that the percentage of questions in the speech of children increases up to the fifth year. Davis (1932) asked mothers to record the questions raised by their children, and all significant facts related to the circumstances under which questioning took place. The

data thus obtained showed that boys ask questions at a faster rate than do girls, and they ask more questions involving causal explanations, while girls ask more on social relations. Of the questions asked, 86 per cent were asked of adults and 14 per cent, of children; 88 per cent resulted from immediate situations and the rest from remote events. In Fig. 49 is shown a distribution of categories of questions. In the case of children from thirty-six to fifty-four months of age, questions make up 14.4 per cent of the conversations of the children in the upper socioeconomic classes, McCarthy (1930) found, as contrasted with 7 per cent in the case of children of the lower classes.

The following conversation of a 4½-year-old girl and her mother, following a story about a six-year-old girl, quoted by Jersild (1941), will illustrate how the child uses questioning to acquire information.

CHILD: I'm four, aren't I?

MOTHER: Yes, four years.

CHILD: What's a year?

MOTHER: (*Explains.*)

CHILD: Is that a long time?

MOTHER: Quite a long time.

CHILD: How long?

MOTHER: It's hard to explain, but it is a lot of days, 365, and that's many.

CHILD: Well, but how long?

MOTHER: Well, well, you know when it was Christmas.

CHILD: Oh, yes, and I had a tree, and once I had the tree in the corner, and once I had it on the table.

MOTHER: Well, that was twice, and it takes a year to have a Christmas. You see we have Christmas, then the time between that Christmas and the time between the next is a year.

CHILD: Well, that's a very long, long time. When I was very small we had a Christmas. Is a year a birthday?

MOTHER: Well, you have one birthday, then the time between is called a year, then you have the next birthday.

CHILD: Yes, three then four—then five—Say, how old are you?

MOTHER: Thirty.

CHILD: How did you stretch up? [Quoted by permission.]

Role of Reading.—Even before the child is capable of reading, he learns many meanings from looking at pictures, from being read to, or from having stories told to him. Even the simplest story books introduce new meanings into the child's life, and his careful observation of pictures shows him details of objects and persons which he formerly had not noticed. Because children enjoy looking at the same books, time after time, and hearing the same stories so often that they can repeat them word for word, they acquire more specific factual material than if their interest were of a more casual, superficial sort. Added to this is the

fact that they will ask innumerable questions about anything that arouses their curiosity in what they see or hear and, in that way, supplement their information.

After the child has learned to read well enough that he does not have to give conscious attention to the mechanics of reading, his reading for pleasure is motivated to a large extent by his desire to acquire information about things which arouse his curiosity. Even the required reading of the school, which has been assigned to him rather than voluntarily selected, teaches him many things which he would not be apt to learn through other sources. A careful analysis of children's reading interests, as discussed in the chapter on play development, will show that the child is motivated by a desire to acquire information about things which are a source of curiosity to him. In most instances, his curiosity is not satisfied by the answers he receives to his questions or from his own observations, and as a result he seeks further information by reading.

Role of Reasoning.—To perceive meanings, the child must be able to see relationships. With each succeeding year, new experiences are interpreted in terms of previous experiences, and the child associates meanings with the new ones, as a result of his realization of how they are related to what he has already learned. The greater the similarity between the new and the old, the more meanings the child can associate with it, provided he is able to perceive the relationships that exist. As a result of this, new experiences become increasingly more interesting to the child and stimulate his curiosity to explore them further.

Before the baby is a year old, observation of his behavior shows that he is interpreting new happenings in terms of what he has already learned. This ability is very pronounced from the time he is three years old and accounts, to a large extent, for the marked increase in knowledge that is apparent at that age. Because the ability to see relationships is so closely correlated with general intelligence, most intelligence tests include tests that measure this ability. Tests to determine how quickly and accurately the child can put the parts of picture puzzles together, how well he can match different geometric forms, or tell the differences in weights of boxes and lengths of line, are found in all standard intelligence scales.

What meanings one can expect at different ages is measured at every age level. Two specific examples will be enough to illustrate this point. In the Terman and Merrill Revision of the Stanford-Binet Scale (1937), the child is shown a card on which are attached a cup, shoe, penny, knife, automobile, and iron. The following questions are asked to determine how meaningful each object is to the child:

1. "Show me what we drink out of."
2. "Show me what goes on our feet."
3. "Show me what we can buy candy with."

4. "Show me what we can cut with."
5. "Show me what we ride in."
6. "Show me what we use to iron clothes."

In order to pass the test, the child at $2\frac{1}{2}$ years must be able to identify three objects, and at $3\frac{1}{2}$ years, five objects.

The "comprehension questions" of the Terman-Merrill series likewise illustrate what one can expect a child to understand at different ages. The child is asked:

At $3\frac{1}{2}$ years:

- "What must you do when you are thirsty?"
- "Why do we have stoves?"

At 7 years:

- "What's the thing for you to do when you have broken something which belongs to someone else?"
- "What's the thing for you to do when you are on your way to school and see that you are in danger of being late?"

At 8 years:

- "What makes a sailboat move?"
- "What should you say when you are in a strange city and someone asks you how to find a certain address?"

Role of Training.—In the development of perception, training plays an important role. While it is true that anything new or interesting arouses the child's curiosity, there are nevertheless many things that he would not notice unless his attention were directed specifically toward them. The more he is encouraged to observe details, the more meaningful the objects in his environment become. Toys, if properly selected, help to develop the child's perception of space and color, just as well-selected books and pictures help him to develop an ability to perceive the beautiful or the comic. Likewise, strict adherence to a definite time schedule enables the child to judge time better than a haphazard schedule would. Music in the home, as a part of the play life of the child, builds up not only an appreciation of music but also a genuine fondness for it.

EXPERIMENTAL INVESTIGATIONS OF PERCEPTION

How the child perceives specific objects and situations, and how his concepts are developed, have been investigated in experimental researches. These research studies relate to space, weight, number, time, self, social, and aesthetic and comic perception, each of which will be summarized briefly.

1. SPACE PERCEPTION

Judgments of direction and distance are difficult for young children and can be learned only through experience. In judging space accu-

rately, the child must learn to compare the space to be perceived with familiar objects whose size or distance from him are known. He must learn to regard the degree of clearness of outline and color and the amount of detail visible as clues, and he must learn that different sensations in the eyes, resulting from convergence or strain, help him to interpret what he observes.

Little babies rarely reach for objects more than 20 inches away from them, which shows that they have some estimate of distance even before they are a year old. Gradually, with practice in reaching for objects, the child learns not only how far away the objects are from him but also in what direction they are. He learns early to judge small distances because he has plenty of opportunity to do so.

From his play with blocks, carts, tricycles, and other favored play equipment, the child soon learns the common cues which enable him to perceive short distances accurately, provided they are studied in relation to his own body. Longer distances, because they are unrelated to his own body as, for example, the distance between two trees or the length of a street block, are extremely difficult for him to perceive. It is generally not until adolescence that the child has the ability to perceive long distances correctly, and even then his judgments are often erroneous.

Influence of Training.—Perceptions of distance, direction, and size are all improved by training. Toys and kindergarten equipment, as beads for stringing, blocks, cylinders, form boards, puzzles, nests of cubes, tricycles, sleds, and coasters, all give the child an opportunity to measure in terms of "long" and "short." In connection with kindergarten and school work, he learns the meaning of inches, feet, yards, pounds, and the different standard measures of space and weight, even though the concepts may be formalized to the point that they are difficult for him to apply to his everyday experiences.

Experimental Investigations.—The child's perception of space has been investigated experimentally from many different angles. Updegraff (1930) studied the acuity in visual perception of distance of four-year-olds and contrasted the results with a similar study of adults. The acuity of perception was found to be surprisingly alike for the children and adults, and there was no significant difference between them in variability of successful response, from day to day. The child's perception of form was studied by Baldwin and Wellman (1928), using a series of four Wallin peg boards. The child's ability to perceive differences in form and to attempt to fit correct pegs into forms gradually increased with age, from two to six years, and with experience. No sex differences were found.

The concept of roundness was analyzed by Long (1940) in the case of children three to six years old, who had been trained to respond to a ball

when paired with a block in a discrimination apparatus. The children were then shown spherical, cylindrical, and two-dimensional figures. The children's responses indicated that all members of the group studied had established the concept of spherical roundness at that age. The concept included cylindrical roundness and two-dimensional roundness.

The question of which plays a more important role, color or form, in the apprehension of an object, was investigated by Brian and Goodenough (1929), who required children, from two years of age to maturity, to choose between two alternatives, form or color, in matching a series of objects. The objects were presented in such a way that the child had to match on the basis of form or color but never both simultaneously (see Fig. 50 for a sample setup). For children under six years of age, solid

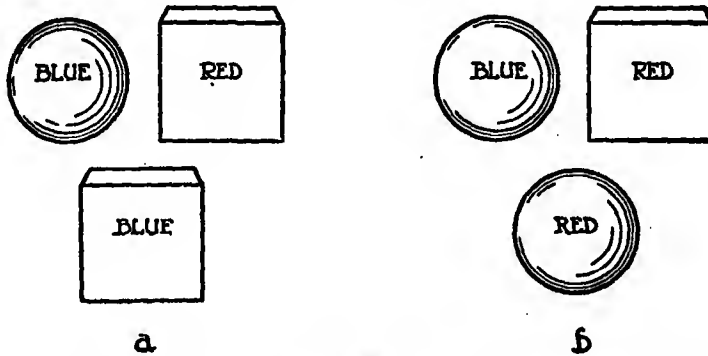


FIG. 50.—Placement of forms for matching. (From C. R. Brian and F. L. Goodenough, *The relative potency of color and form perception at various ages*. *J. exp. Psychol.*, 1929, 12, 199.)

geometric forms painted different colors and surface forms of different colors were used, while, for the older subjects, surface forms only were used. It was found that children under three years of age showed a marked tendency to match on the basis of form rather than color; children from three to six matched on the basis of color; while those over six matched on the basis of form.

2. PERCEPTION OF WEIGHT

Accurate judgments of weight depend partly upon judgments of size and partly upon knowledge of the weight of different materials. This is often confusing to a little child who has not yet learned from experience that different materials have different weights. A ball of cotton, for example, is judged to be heavier than a block of wood of smaller size, or a lead weight, because the cotton is larger in size than either the wood or the lead. The child's judgments are more in terms of size than weight, and as a result many accidents with toys and household objects occur.

This is due to the fact that the child does not make the necessary muscular adjustments to handle them without breakage. A small *objet d'art*, for instance, picked up by the child in his curiosity to examine it, may slip through his fingers and break because he did not expect it to be as heavy as it was and did not make the necessary motor adjustments to handle it safely.

Gradually the child learns, from experience with toys and articles with which he comes in constant contact, that certain things are "heavy," while others are "light." (Of even greater importance, he learns that he must consider what the object is made of and not judge it in terms of size alone. He discovers from experience that if he wants to determine just what the weight of an object is, he must pick it up, not merely look at it. If he holds it with his fingers, or places it in the palm of his hand, and then moves his hand up and down, as if lifting the object, its true weight becomes more evident than if he merely holds his arms stationary.

These cues, as aids in the perception of weight, are learned gradually and depend to a certain extent upon the variety of experiences the child has had. By the age of five, according to Terman's (1922) *Revision of the Binet-Simon scale*, the child should be able to tell the difference between 3- and 15-gram weights that are of the same size and identical in appearance. In the elementary-school years, between six and twelve, there is a marked improvement in the child's ability to perceive small differences in the weight of objects of the same size and shape. This ability reaches its peak of improvement around the twelfth year, when it is nearly mature in its development.

3. NUMBER CONCEPTS

Words relating to numbers are used soon after the child starts to speak but their meaning is rarely ever known. The use of number words, between the ages of two and three years, is thus merely a form of "parrot" speech. What a number really means to a child and when he can use it in a meaningful way, it is difficult to determine. This matter has been discussed by many of the baby biographers, but there is little experimental evidence concerning the matter. Douglass (1925) investigated the number concepts of kindergarten children by use of cards on which dots, 1 to 10 in number, were placed. The cards were then exposed to the child long enough for him to see them but not long enough to count them. Marbles, held in the experimenter's hand, were also presented to the child, and he was asked how many marbles there were. The results of this experiment showed an accurate concept of 1, 2, and 3, a "serviceable" concept of 4, but a rather vague concept of the numbers 5 to 10. Douglass concluded that the development of number concepts is a function of age and the educational development of the child. At six

years, Terman (1922) found, the average child can count 13 pennies when pointing to each.

The child's concepts of large numbers, especially numbers over 100, are vague and confused. He may use the words "hundred," "thousands," "millions," or "trillions," but a close questioning as to what these numbers mean to him reveals that they mean "many" or "large numbers," but nothing more specific than that. It is not until his study of arithmetic is well advanced that these terms come to have a definite meaning for the child. Even then, the meaning is more abstract than specific, because the child learns the meaning of these terms in connection with abstract problems rather than in relation to specific situations.

4. TIME PERCEPTION

Time perception in adults is none too accurate, but it is even worse in the case of children. This explains the apparent disobedience of young children when they fail to come home at the appointed time. They are unable to judge time correctly and, because of their interest in play or some other activity, time passes more quickly than they realize. The restlessness of a child during a call or when riding on trains or in automobiles may be traced to the fact that time passes slowly for the child, who is bored because he is idle.

The young child has no idea of the length of time, or no means by which to judge it. In order to estimate time units successfully, one must take into consideration the activity engaged in. One hour spent in play seems much shorter than an hour spent in school. Until the child learns that he must consider his activity when he estimates time, he cannot judge it correctly. Much of the dallying over eating and dressing, which occurs between the ages of three and five years, may be traced to faulty time perception. Because a young child does not have a crowded schedule, his dallying does not interfere with the rest of the day as seriously as it would in the case of an adult. Unless specific time limits are given for the completion of a task, the child is apt to develop the habit of dallying. Another example of the poor judgment of time units on the part of a young child is his estimate of the length of the night. Invariably, he regards this as a short period because he falls asleep quickly, sleeps soundly, and awakens only a short time before he gets up. As a result, he thinks he has been in bed for only a few minutes, instead of for the entire night.

Perception of the time of day, day of week, or season of the year is more accurate because the child can associate specific activities with the time, and this acts as a cue to enable him to interpret them correctly. Day is distinguished from night because the former is light and the latter dark and because day is the time when he can be up and night is the time

when he must sleep. Morning is perceived as different from afternoon because of the difference in activities. Morning is play time for the young child, and afternoon is nap time and the time for clean clothes. The days of the week are likewise known through the activities associated with them. Sundays are usually known first because the father is at home, and the routine of the day is often interrupted for family trips. By the age of four or five, most children know what day it is, though they do not have a clear concept of months and seasons until a year or two later.

Experimental Studies.—Experimental studies of the child's "time sense" have been limited in scope. Two studies will serve to illustrate the approach used and the findings obtained. Elkins (1928) asked boys and girls, ten to fifteen years of age, to judge various time intervals, such as 5, 10, 15, and 30 seconds and 1, 2, 3, and 5 minutes. He found large errors in the children's judgments. The longer intervals were usually depreciated, while the smaller ones were exaggerated. The best evaluation was in the case of intervals from 30 seconds to 1 minute in duration. Boys were found to estimate long intervals more successfully than girls, while girls were superior to boys on short intervals.

A more extensive investigation of the school child's perception of time was made by Oakden and Sturt (1921). Their investigation included such problems as the child's understanding of ordinary time words and symbols; ability to form a concept of time extending into the past and future; knowledge of the characteristics of definite epochs in the time scheme; methods used in thinking about historical data; and the importance the child attaches to time in comparison with other elements in his experience.

Their investigation brought out the following facts in relation to the child's understanding of time. At the age of four years, children showed little understanding of the meaning of the time of day. The five-year-olds made a greater number of errors in answering questions about the duration of time than about the time of day. After seven, few errors of this sort occurred, which showed that by that age the child had a fairly accurate knowledge of time. Before the age of seven or eight, knowledge of the day of the month and the year was limited, because counting, which is essential for this, is difficult for the child. By the age of eight to ten years, however, most children were found to be able to name the year.

The ability to think of the past as different from the present, according to Oakden and Sturt, passes through two stages of development. The first, or "negative," stage is one in which the past differs from the present as, for example, the wearing of skins or the worship of idols. In the second stage, the child not only distinguishes historical periods but he also forms a picture of successive epochs not unlike that formed by the

adult. The child's knowledge of conventional time, Oakden and Sturt concluded, is a matter of gradual development, beginning before the age of three or four and reaching the adult level at thirteen or fourteen years. The most important period in its development comes at the age of eleven, when a rapid improvement in all types of time knowledge occurs.

5. CONCEPTS OF SELF

Before the baby forms definite concepts about other people, he forms concepts about himself. These concepts are then used as a standard by which he interprets others. He discovers meanings about his own body through handling the different parts and by looking into a mirror. This begins as early as the fourth or fifth month. He watches his fingers, pulls at his hair, ears, nose, and toes, pats and strokes his skin, sucks his fingers and toes, and watches his movements in a mirror whenever he has an opportunity to do so.

Concepts of self develop rapidly during early childhood because of the child's interest in himself. According to the Terman and Merrill (1937) scale of intelligence tests, the two-year-old should be able to identify three parts of the body when shown a large paper doll and when asked by the experimenter to point out the "dolly's" hair, mouth, ears, and hand. At $2\frac{1}{2}$ years, the child should be able to identify all four parts. According to Terman's 1922 Revision (1922), the three-year-old should know whether he is a boy or girl, should know his last name as well as his first, and should know where his nose, eyes, mouth, and hair are.

As a matter of fact, children of three to four years of age know much more about themselves than this. They know the different parts of the body, such as the hands, fingers, feet, toes, legs, arms, and "tummies," and they know what they are used for. They also know what articles of clothing belong to the different parts of the body. By the age of six years, Terman (1922) found that the average child could distinguish the right from the left side of his body and, in the following year, could tell how many fingers he had without counting them.

In the development of concepts of self, children often build up two distinct concepts. (1) One comes from external experiences and contacts with others. The child has specific concepts relating to his body, his appearances, and how he compares in abilities of different types with the children with whom he associates. This type of concept is developed first, because the child's earliest experiences are objective. As the child reaches the school age, subjective experiences become more meaningful to him. (2) As a result, he establishes another type of concept of self based on his thoughts, feelings, and emotional experiences. It is often difficult for him to coordinate the subjective and objective concepts, and

consequently he is apt to think of himself as a dual personality, with a specific appearance and with a specific personality make-up. Gradually, as the child reaches adolescence, the subjective and objective concepts of self fuse, and the adolescent perceives himself as a unified individual.

6. SOCIAL PERCEPTION

Social perception means the ability to understand, from observing facial expressions and behavior of others, just what their thoughts and emotional reactions are. It includes the ability to "size up" the personality of others quickly, accurately, and on the basis of the cues available. If the individual is to make satisfactory social adjustments and get along with reasonable success with all types of people, he must develop social perception. As a result of his ability to size up others, the child then modifies his own behavior to fit into the accepted social pattern. He thus becomes socialized to the extent that he is a welcome member of the social group to which he belongs.

Social perception results from observing the behavior, emotional expressions, and voice of others. Perception of sound develops early, and the baby first sizes up others by cues coming from different tones of the human voice. He learns to distinguish familiar from unfamiliar persons, and he can distinguish different individuals he knows. He can differentiate between angry, friendly, and frightened voices, and he can tell animate from inanimate objects. The baby differentiates the voice from other sounds by the time he is one month old, and at the age of two months he shows an interest in people by smiling and laughing when he comes in contact with them. By the third month, he can differentiate between strangers and familiar persons, while at the age of six months he is greatly influenced by facial expressions.

The beginnings of social perception have been investigated by Karl Bühler (1930), who found that, at the age of three months, the baby smiles at an angry adult in the same way as when the adult looks friendly. This is social *imitation* but not *perception*. By the time the baby is five months old, however, he responds to an angry face with some negative response, generally crying. Even then, Bühler contends, the behavior is imitative in that the baby is merely reflecting the positive and negative expressions of the adult without understanding them. It is not until he is eight months old that he responds to the emotional behavior of others in a way which signifies that he has an understanding of the facial expressions. An angry face causes the baby to turn away, while a smiling face leads to aggressive movements, such as coming toward the stranger, holding out his arms, or handing him a toy.

Because of his constant contact with them, the little child learns to "size up" parents, playmates, and teachers with a marked degree of

accuracy. In the case of strangers, on the other hand, he is apt to be incorrect in his perceptions because of his limited experience in dealing with all types of individuals. Little children are often tactless for this same reason. Because of errors in social perception, they behave or speak in a manner that is regarded as rude or tactless by others. This, for the most part, is unintentional and may be traced to a wrong "sizing up" of the situation, especially when strangers are involved.

Experimental Investigations.—In an experimental study of the child's ability to interpret facial expressions, Gates (1923) used photographs showing six common emotional reactions, joy, anger, fear, scorn, surprise, and pain. These pictures were shown to children, three to fourteen years old, of varying social status, and the children were asked to tell what the lady in the picture was doing or how she felt. To obtain an adult standard of comparison, Gates showed the pictures to students in an introductory course in psychology at Barnard. For children, the order of difficulty, from least to greatest, was laughter, pain, anger, fear, surprise, and scorn, and for the adults, laughter, scorn, fear, anger, pain and surprise.

Laughter was interpreted correctly by more than half the children studied at three, pain by more than half the group at six, anger at seven, fear at ten, surprise at eleven, and scorn, at the same age, by only 43 per cent of the group. Children from the better social environments slightly surpassed those from the poorer environments in all except the interpretation of pain, but the differences were very slight. The same held true for sex differences. At the ages of four, five, and nine years, girls were slightly superior to boys, while at six, seven, and eight years, the boys surpassed the girls.

Kellogg and Eagleson (1931), using data obtained by Gates, made comparisons with Negro groups and found essentially the same results. The percentage of successful responses for both racial groups increased with age, and the order of difficulty of perceptibility for the two groups was the same. The only picture in which the successful responses of the Negro child exceeded those of the white child to any appreciable extent was in the case of fear. Although Gates found only slight sex differences in the group of white children studied, Kellogg and Eagleson found rather pronounced sex differences in the case of Negro children. Boys were found to be superior to girls among children under seven years of age, while girls exceeded boys in the percentage of correct responses made from seven to fourteen years.

Studies of the child's social concepts by Meltzer (1925, 1926) were made by giving children, from grade four to high school, individual questionnaires with words selected to test the child's knowledge of social situations, such as *democracy*, *socialist*, *big business*, *capitalist*, and

imperialism. The number of words used by the child in a personal interview was accepted as the measure of the child's talkativeness about these concepts. The results of his study indicated that in general the number of words used is a criterion of growth in grasp of concepts. Analysis of the meanings given showed that in many cases there was a feeling about the concepts but an absence of meaning. Many of the answers showed knowledge of a particular or a fact but no general idea. In other cases, the child had ideas but too limited a vocabulary to express them properly.

7. AESTHETIC PERCEPTION

What the individual perceives as beautiful depends to a large extent upon the *associations* he forms. Pleasant associations lead him to believe that the person or object he views is beautiful, while unpleasant associations result in his perceiving it as ugly. In addition to this, the new and unfamiliar is perceived as ugly, while the old and familiar is perceived as beautiful, provided the associations formed during the individual's experiences have been of a favorable sort.

Nothing is beautiful or ugly in and of itself. How it is perceived is thus a matter of individual association. What the young child perceives as beautiful is what he likes. People whom he likes are regarded as beautiful, no matter how they may be judged by others. This is illustrated by the fact that when shown pictures of women's faces in the Terman Scale (1922), many five-year-olds pick out the ugliest rather than the prettiest face. When asked why they made the choice, the answer is invariably the same, "She looks like my nurse," "She looks like grandmommy," or "She looks like our cook." In each case, the resemblance to a person the child likes is responsible for the way the child perceives the picture.

Brightly colored, gaudy pictures which represent movements of people or machines appeal to the child. Any picture containing people doing commonplace things, or sailboats, trains, horses, or automobiles is liked by the child. Landscapes do not interest him unless they contain pictures of people or animals doing things. The *ability to understand* the meaning of a picture is responsible, to a large extent, for the child's appreciation of its beauty. White and Johnson (1930) investigated the problem of what young children, two to five years old, can understand about pictures by showing them spontaneous crayon drawings, made by four-year-old children of the Child Institute of Johns Hopkins University. The pictures easiest for them to name had drawings of people in them, and the next easiest were pictures of houses. When compared with drawings of modern artists, it was found that the children's drawings had greater significance for the children than did those of the artists.

The importance of understanding the meaning as a factor in aesthetic perception was further investigated by White and Johnson, who hung reproductions of modern paintings on the wall, arranged in order from most impressionistic to most realistic. The children were asked to choose the ones they liked best. The pictures most frequently chosen were those which were most realistic and which therefore the children were most able to understand.

The *cultural patterns* of the social group are a factor of importance in determining what the child will perceive as beautiful. Through association with adults, little children come to accept the adults' criterion of beauty, often without questioning whether or not it fits into the pattern of their own likes or dislikes. A thing is pretty because, "Mommy says so," or ugly because the teacher has told them it was. The important role the cultural patterns of the group play in the child's aesthetic perception is well illustrated by their responses to the aesthetic-comparison test in an intelligence-test series. At the age of 4½ years, for example, one of the tests in the Terman and Merrill (1937) series consists of showing the child three cards with pictures for comparison. In each case, the child is asked, "Which one is the prettiest?" Few children, unless they are definitely below average in intelligence, fail to select the one which, according to adult standards, is considered to be the prettiest.

The "Prettiest Thing."—One of the best ways of determining what the child perceives as beautiful is to ask him. This was done many years ago by Barnes (1902) who asked children, seven to thirteen years old, to write papers explaining what they thought was the "prettiest thing" and why. At the ages of seven to eight years, perception of the beautiful centered around flowers, animals, and dolls, with dolls the most important center of interest for the younger children. As the children reached the ages of twelve and thirteen years, landscapes stood out as the favorites. But at no time in the age period studied did the children show a preference for buildings, pictures, or works of art. A few sex differences were apparent. Girls showed a greater preference for flowers, landscapes, toys, pictures, and clothes than did boys, while boys, on the other hand, preferred animals and things made more often than girls did. A similar study was made by Blonsky (1932) with the use of a questionnaire given to children ranging in age from six years to maturity. To the question, "What do you consider the most beautiful?" 99 per cent of the group said flowers, trees, landscapes, works of art, and humans. With increase in age, landscapes, rivers, brooks, and views of the sea became more popular, while flowers, trees, forests, parks, and gardens were less popular.

Appreciation of the beautiful was tested by Drought (1929) with a battery of nine sets of pictures, with five in each set, one of which

embodied all the important principles of art, while the other four violated these principles. The children's responses to these pictures showed that sensitivity to good art increases with education and general training. Violation of unity proved to be less annoying than violation of harmony and proportion. A similar study was made by Berliner (1918), who had school children rank picture cards according to the aesthetic value of the pictures, and the results were then compared with the rankings of college students. A high uniformity in the group taste of the school children was found, but there was an absolute break between it and that of the college group. This was due, Berliner explained, to age differences and not to some other factor, such as social status.

Aesthetic Perception in Adolescence.—The adolescent's perception of the beautiful differs in two ways from that of the child. (1) The stimuli capable of arousing it are more numerous than before. (2) Emotional experiences accompanying aesthetic perception are greater and more profound than during the earlier years. No longer is perception of the beautiful a mental experience alone. At this age, pronounced emotional reactions accompany it. Enthusiasm for the beautiful rarely lasts for a long time, but while it lasts, it is generally accompanied by a desire for some sort of artistic expression.

Typically, the adolescent prefers more subdued colors and better blends than is true of the child. Symmetry and balance are necessary if the work of art is to be judged beautiful by the adolescent. The adolescent's perception of physical beauty in the human is based upon a combination of all the features rather than on one alone. What is judged as beautiful is that "typically feminine" or "typically masculine," as determined by the cultural patterns of the group. Likewise, fashion, which decrees what is in style at the moment, is a major factor of importance in determining the adolescent's standards of physical beauty. No matter how excellent the separate features of the individual may be, no one is considered beautiful by the adolescent whose appearance is not "up to the minute" in style.

L. S. Hollingworth (1935) found from a study of photographs of both average and intelligent adolescents that those of high-grade intelligence were judged to be more beautiful than those of average intelligence. Human ugliness was judged in terms of association, and the four classifications of human ugliness were found to be (1) the morally degraded, (2) the dirty and dusty, (3) those of bestial appearance, and (4) the sickly. This illustrates once again how important a role association of previous experiences with present experiences plays in the individual's perception of the beautiful.

Color Preferences.—Experimental investigations of color preferences have been numerous. Attempts have been made to discover what color

or colors children of different ages prefer as a criterion of aesthetic perception. In some of the studies, children are asked to list, in order of preference, their "favorite" colors; in others, their preferences are indicated by checking a list of colors; while still other studies use color samples, in the form of colored papers or materials, for the child to select the colors he considers most beautiful. Regardless of which of the three methods is used, the results have been found to be very similar. At one age, there is a definite preference for one or two colors, while at later ages other colors stand in first position. The change in color preferences from one age to another is influenced by the cultural patterns of the group which the child learns from his contacts with the group.

Before a young child can show color preferences, he must be able to distinguish colors and hues. Just when he is able to do this has been investigated by Staples (1932), Woolley (1910), and Cook (1931). Staples presented colors on a gray background to babies, two months to two years old. When the babies were too young to grasp the colors, the time they took to look at the colors, as contrasted with the time they looked at gray, was used as an indication of their ability to perceive color. In the case of older babies, colors were presented for grasping. By the end of the third month, the babies looked at the colors twice as long as at gray, but there was no significant difference in their responses to red, green, blue, and yellow. From the age of six to twenty-four months, however, the babies responded differently to the different colors. The order of preference was red, yellow, blue, and green. There was a fairly close agreement in color preference at this age. After two, yellow steadily lost its preference value, while blue and green attained a higher rank. A slight sex difference appeared in which girls showed an earlier interest in blue and green than did boys.

Woolley (1910), in a study of the color preferences of one baby, noted that when brilliant rose-pink and dull-blue rattles were shown to the baby, no preference was noticeable until the middle of the sixth month, when a preference for the pink rattle appeared. By the end of that month, it was decidedly the favorite. Woolley studied color preferences further, by using colored papers in pairs and having the baby reach for the color preferred. She noted a marked preference for red, an attitude of indifference to green, and no real preference for yellow as compared with blue. Color discrimination, Cook (1931) discovered, appeared by the age of two years, when young children could match with 45 per cent accuracy color specimens which differed in hue, brightness, or saturation. By the time they were six years old, they could match the colors with 97 per cent accuracy. At every age tested, the children were able to discriminate more accurately between differences in either brightness or saturation.

Color preferences of kindergarten children as compared with those of college students, Dashiell (1917) reported, showed blue to rank in first place, closely followed by red, while last place was given to orange. Preferences, however, were very slight at this age as contrasted with a much more definite order of preference among college students. The rank of preference was almost the same for both age groups with the exception of green and yellow, where the order of preference was reversed. Among the kindergarten children, sex differences were apparent, especially in the second favored color, which was red for boys and violet for girls. Katz and Breed (1922) reported that blue was the most frequently preferred color at every age from five to fifteen years, with green a distant second, red a close third, violet and yellow next, and orange the least pleasing. There was a loss in popularity of yellow and orange and an increase in popularity of green as the children grew older. Young children from the poorer districts showed a greater preference for red than did those from the better districts, but this difference decreased with age.

The younger the child the more pronounced is the preference for saturated colors. No color is too bright to please him, whether the color be used in clothing, toys, or merely as a sample in a test. Pastel shades and soft hues are perceived as ugly by young children. With increasing age, however, this attitude changes. By adolescence, both boys and girls show a marked tendency to prefer the duller shades and less saturated hues, and they regard the saturated colors as "loud" or "hideous." The reason for this change in attitude may be traced to the influence of training. This is apparent in contrasts between adolescents of superior social, cultural, and educational groups and those of less favored groups. In the case of the latter, preference for well-saturated colors is similar to that of children of the younger ages.

Preferences for certain color combinations, Dashiell (1917) noted, are very indefinite among young children. Red-green and red-blue combinations are the favored ones, while orange-green is the least favored. Among college students, on the other hand, red-blue and yellow-violet combinations stand out as favorites, while, like children, the college students regard the orange-green combination as the least attractive. At every age, more pronounced individual differences occur in preferences for color combinations than in preferences for individual colors. This is due, to a large extent, to the different associations various individuals have with color combinations.

Music Appreciation.—Liking for music on the part of young babies is apparent from the fact that they like to be sung to or to hear music even before they are a year old. Many emotional outbursts or painful experiences are quieted by means of music. From their early association with music, they learn to like certain types rather than others. Because the

songs and music which a young child first hears have a definite "tune" or rhythm, the child learns to like music of that type and prefers it to music which lacks a definite tune. By the time he is three, the young child has definite preferences for certain types of music and has his "favorites" within each type. The more often he hears his favorites, the more beautiful they are to him. With each succeeding year, his affection for the old and familiar increases, and this is an important factor in determining his standard of what is beautiful in music.

In addition to the role played by association in aesthetic perception in music, understanding of meaning is also important. By kindergarten age, the child can discriminate pitch and intensity with a fair degree of accuracy, can pitch his voice when a model pitch is given, and can march in tune to the rhythm of music. Dashiell (1917) judged kindergarten children's music appreciation by their preference for tone intervals or harmonies and compared the results with those obtained from studies of college students. The intervals used were major third, major seventh, major fifth, octave, and minor second. While college students reacted almost unanimously to the different harmonies as pleasant or unpleasant, the children showed a great variability in their likes and dislikes for each interval, with no evidence of clear-cut preference. This difference Dashiell believed arose from differences in training.

8. PERCEPTION OF THE COMIC

Nothing is comic of its own accord. Whether we perceive it to be comic or not depends to a large extent upon the meanings we associate with it. Like all other types of perception, perception of the comic is dependent to a large extent upon past experiences and how the memories of these experiences are associated with new experiences. In addition, reactions to comic situations depend upon the mood and emotional reactions of the individual at the time when the comic situation appears. A child, during a temper tantrum, can see nothing funny in a situation which, under normal conditions, would seem to be very funny. Similarly, the health of the child influences his ability to perceive the comic element of a situation.

Perception of Comic at the Preschool Level.—What young children perceive as comic has been carefully investigated. Fenton (1925), in a study of her own baby, made a month by month record of the different things which called forth laughter. She reported, for example, that at the age of four months vocal play amused the baby greatly, while at six months the baby enjoyed tormenting the people who dressed him, blowing bubbles in water given to him to drink, or dropping things handed to him. At the age of nine months, his perception of the comic included watching things fall, such as watching the splash made by milk as it falls

from his mouth to the floor; at twelve months, making funny faces; at fourteen months, hiding from people and laughing when they looked for him; and at twenty-four months, trying to squeeze through narrow places or carry out different kinds of stunts.

Observations of nursery-school children, over a period of several months, led Kenderdine (1931) to conclude that the following situations were the ones that most frequently produced laughter in young children:

1. Motions made by the child himself, by others, or by objects.
2. Noises made by the child himself, by others, or by objects.
3. Socially unacceptable situations.
4. Grinnaces made by the child himself or by others.
5. Inferiority in others.
6. Pleasure of the child in an occupation or accomplishment.
7. Situations showing appreciation of humor.
8. Word play.
9. Imitative laughter.
10. Situations involving make-believe.
11. General well-being and happiness.

Which of the common laughter-producing situations most often calls forth laughter in preschool groups was investigated by Justin (1932). In the following table are given the percentages of laughter responses for the different age groups:

TABLE XXXIX.—PERCENTAGE OF LAUGHTER RESPONSE OF CHILDREN TO TOTAL SITUATIONS AND TO EACH OF THE SIX MAIN DIVISIONS

Situation divisions	Three years old		Four years old		Five years old		Six years old	
	Smile and laughter	Laughter	Smile and laughter	Laughter	Smile and laughter	Laughter	Smile and laughter	Laughter
1. Surprise-defeated expectation.....	85.83	11.67	93.75	8.33	94.17	23.75	90.41	10.83
2. Superiority-degradation.....	40.67	9.83	53.17	7.00	69.17	19.33	62.67	10.83
3. Incongruity and contrast.....	56.25	15.63	72.92	11.46	89.06	33.85	84.38	28.64
4. Social smile as a stimulus.....	91.67	12.50	95.83	4.17	91.67	20.83	91.67	8.33
5. Relief from strain.....	47.92	4.17	52.08		54.17	4.17	41.67	2.08
6. Play.....	56.25	4.17	65.10	5.73	80.73	22.40	72.92	4.69
Total.....	54.86	10.03	66.13	7.41	78.32	22.22	72.30	12.19

Source: JUSTIN, F. A genetic study of laughter provoking stimuli. *Child Developm.*, 1932, 3, 127.

As may be seen from the material just presented, the social smile at almost every age was the best stimulus to smiling and laughing, surprise second best, incongruity third, play fourth, superiority fifth, and relief from strain the least effective. In the case of incongruity, superiority, and play situations, laughter became greater as age increased. In the other three situations, age differences were small. The general trend consisted of an increase in responsiveness to the fifth year, followed by a slight decrease in the sixth year. No marked sex differences appeared in responsiveness to laughter-provoking stimuli, though boys laugh more than girls, while girls smile more than boys.

Kimmins (1928) noted that the preschool child laughs at the funny antics of domestic animals, at anything of an incongruous character in the home, and at the minor misfortunes of others. At the end of the preschool age, there is a beginning of play with words. Verbal humor gradually supplements visual humor, and the child laughs as often at what he hears as at what he sees. He finds unusual combinations of words especially amusing, such as, "Peter Piper picked a peck of pickled peppers," and "A noisy noise annoys an oyster." Soon the child begins to make puns and laughs at the way he can associate similarity of sound with contrast of meaning.

The relationship of intelligence to laughter has been studied by Kenderdine (1931). In the case of 16 nursery-school children with I.Q. scores ranging from 100 to 130, the average I.Q. was 118.06 and the average number of laughs, 4.7. Ten children with an average I.Q. of 140.6 were found to have an average number of laughs of 13. Kimmins (1928) reported that humor correlates very highly with intelligence. This is true of every age and not of the preschool years alone.

Perception of the Comic in Later Childhood.—What the older child perceives as comic was investigated by Kimmins (1928), who had several thousand children write accounts of the funniest stories they had ever read or heard, the jokes which had made them laugh most, and the sights which they considered to be the most comical. The accounts given by the children revealed some interesting points. At the end of childhood, from approximately 11½ years to the end of the thirteenth year, there is a marked decline in verbal humor, while funny sights still make their appeal. Or, expressed in a different way, childish funny sights retain their popularity longer than the funny stories that deal with similar material.

From the ages of seven to ten in girls and eight to ten in boys, riddles are regarded as the favored funny stories, but their popularity declines at eleven years. Children laugh at the misfortunes of others, mistakes made in examinations when they know the answers, and at entertainments in theaters, movies, and circuses. Hall and Allin (1897) listed, as

other sources of perception of the comic in children, recovery from slight fear, making faces, caricatures, practical jokes, immodest things or reference to them, religious sanctities, people who defy authority, and people in predicaments.

Comedy films appeal greatly to children because in them the actors do things which the child would like to do but which he knows he would not be allowed to do. If he attempted to do them, he would be punished, while the wrongdoer on the screen "gets away with it." The appeal is especially great if the pranks played by the actors have settings similar to that of the child's environment and if the practical jokes are played on personages resembling the persons who have authority over the child, such as a nurse, teacher, or parent.

Brumbaugh and Wilson (1940), by means of a *Funny test*, in which children were asked to indicate what they thought funny, investigated perception of the comic in children from grades three to six. The children were asked to mark three answers to each question, three samples of which are:

I. *The funniest people in the movies are*

- | | |
|----------------------|--------------------|
| 1. Betty Boop. | 8. Marx Brothers. |
| 2. Charlie Chaplin. | 9. Martha Raye. |
| 3. Donald Duck. | 10. Mickey Mouse. |
| 4. Eddie Cantor. | 11. Mae West. |
| 5. Joe E. Brown. | 12. Popeye. |
| 6. Joe Penner. | 13. Ritz Brothers. |
| 7. Laurel and Hardy. | |

IV. *Children make me laugh when they*

- | | |
|---------------------------|----------------------------|
| 1. Act in school plays. | 7. Make mistakes. |
| 2. Are stupid. | 8. Make noises. |
| 3. Fight. | 9. Stutter. |
| 4. Get punished. | 10. Talk out in school. |
| 5. Laugh, so I laugh too. | 11. Tell jokes or riddles. |
| 6. Make faces. | 12. Tickle me. |

XVII. *Draw a funny picture. Tell why it is funny.*

From the list given, the 20 items considered funniest were selected, two or three from each question of the checked list. The change in the children's attitude from grades three to six was then studied and the percentages of selection, given by the children for what they thought especially funny, were summarized in the following table:

The results presented above show that simple things which have little meaning, such as being tickled or seeing people with big ears and noses, decrease in funniness as the child grows older, while the items that show increasing funniness have more meaning as children grow older.

TABLE XL.—THINGS THOUGHT THE FUNNIEST BY BOYS AND GIRLS IN GRADES
3 AND 6

Things considered funny	Grade 3		Grade 6	
	Boys	Girls	Boys	Girls
Little or no change:				
Charlie McCarthy.....	18	23	21	22
Very fat.....	21	23	19	20
Make faces.....	16	18	18	20
Teacher tell funny stories.....	16	18	15	18
Teacher tell joke.....	17	15	12	17
Dunces.....	14	13	17	14
Decreasing funniness:				
Children tickle.....	30	30	17	24
Big ears.....	27	23	21	17
Grown people tickle.....	21	22	13	17
Donald Duck (comics).....	21	13	9	5
Teacher read funny stories.....	16	16	12	13
Big noses.....	19	18	16	16
Grown people kiss.....	24	22	13	8
Increasing funniness:				
Clowns.....	21	24	26	27
Children tell jokes.....	17	17	29	27
Katzenjammer Twins.....	17	13	22	25
People wear funny hats.....	7	10	13	21
Laurel and Hardy.....	7	6	22	18
Ritz Brothers.....	10	10	19	18
Burns and Allen.....	9	11	12	19

Source: BRUMBAUGH, F., and WILSON, F. T. Children's laughter. *J. genet. Psychol.*, 1940, 57, 27.

Perception of the Comic in Adolescence.—Subjective comic, or the ability to perceive the comic elements of a situation in which the individual is involved, is rare in adolescence because the adolescent is very sensitive to the opinions of others. The adolescent enjoys laughing at others because it gives him an increased sense of superiority. Any situation, story, or joke, which deals with the predicament of others, is perceived as comic, and the adolescent finds it increasingly funny the more often it is repeated. A similar situation, story, or joke, which involves the adolescent, is not only not perceived as comic by him but, with repetition, it becomes the source of increased annoyance rather than increased amusement.

In order to discover what the adolescent perceives as comic, Kambouropoulon (1926) requested 70 students at Vassar College to keep "humor diaries" for 7 successive days as a means of determining what girls of the late adolescent years consider comic. She found that the

situations in which the students laughed could be classed in six divisions, as follows:

1. Laughter when there is no objective cause, no humorous event or situation to arouse it, as laughter occurring when others are laughing without knowing why this laughter takes place.
2. Laughter which has an objective cause, as when people fall down or are awkward in their behavior.
3. The mental inferiority of another person as is seen in the stupidity, mistakes, absent-mindedness, social blunders, or naïve remarks of children.
4. The inferiority of another person as it is brought out by witty remarks or satirical comments.
5. Incongruity of the situation, especially where a person in authority is in a predicament.
6. Humor caused by incongruity of ideas, as is apparent in puns or clever remarks not directed at only one person.

9. ERRORS IN PERCEPTION

In the observations of his environment, the child very often misinterprets what he observes. He may see, hear, smell, taste, or feel correctly, but the error in observation results from the association of wrong meanings with what he has observed. Unless the errors are corrected soon after they occur, the association, through repetition, becomes firmly established and, as a result, faulty concepts are developed. Misconceptions, formed early in childhood, are especially serious because they are often not detected by adults until they have become so firmly established that it is difficult or, in some cases, impossible to eradicate them later.

Causes of Misconceptions.—Errors in perception, resulting from the association of faulty meanings with what has been observed, may be traced to a number of causes, the most important of which are:

1. *Faulty information*, resulting from what the child has been told or what he has read. When parents, for example, are not certain about the correct answer to the child's question, they may "make up" an answer, so as to satisfy his curiosity; they may give him information which they sincerely believe is correct but which is erroneous in one respect or another; or, owing to preoccupation with other interests, the individual questioned may misunderstand the child's question and answer it as he thought the child had asked it. Or the child's information may be faulty because he has read material from unauthoritative sources or from books which are now out of date and the material given in them disproved by recent discoveries.

2. *Misunderstanding of words* used in explanation to the child. Since the young child's comprehension is limited, because of his limited vocabulary, he may misinterpret the meaning of the words used by others in explanation of material about which he is seeking information.

3. *Faulty reasoning* may cause misconceptions. When two objects or two words are alike in one or more aspects, the child concludes that they are alike in every way. As a result, he establishes misconceptions based on conclusions drawn from too limited data.

4. *Vivid imagination* in the form of dreams or daydreams may lead to conclusions not justified by the data available. In developing his concepts, he supplements data obtained from actual experiences with data of a purely imaginary sort. Many of the "white lies" of early childhood can be traced to misconceptions from this source.

Hall's Study.—One of the earliest and, at the same time, one of the most important investigations of the accuracy of the child's concepts of objects or experiences in his everyday life was made by G. Stanley Hall (1891). With the aid of school teachers, trained for the task, Hall asked Boston school children, in September of the year they started school, a number of questions and then recorded the answers given. Several years later, a similar study was made in Kansas City, during the spring

TABLE XLI.—CHILDREN'S MISCONCEPTIONS

Name of the object of conception	Percentage of children ignorant of it		
	In Boston	In Kansas City	
		White	Colored
Beehive.....	80	59.4	66
Squirrel.....	63	15	4.2
Frog.....	50	2.7	
Cow.....	18.5	5.2	
Growing wheat.....	92.5	23.4	66
Growing strawberries.....	78.5	26.5	1.1
Growing potatoes.....	61		
Location of lungs.....	81	26	44.6
Right and left hand.....	21.5	1	10.2
Stomach.....	6	27.2	45.9
Dew.....	78	39.1	70.2
Moon.....	7	26	53
River.....	48		
Triangle.....	92		
Green.....	15		
Origin of leathern things.....	93.4	50.8	72.3
Origin of bricks.....	81.1	33.1	53
Origin of meat (from animals).....	48	8.3	12.7
Source of milk.....	20.5	4	

Source: HALL, G. S. The contents of children's minds on entering school. *Ped. Sem.*, 1891, 1. Condensed from pp. 139-173.

months, and the results of that study were combined with Hall's. In Table XLI are given a few of the misconceptions of young children at the time when they entered school.

From the data just presented, it is apparent that young children, when they enter school, have more faulty information than one would expect. The lower percentages given for the Kansas City children than for the Boston children may be explained largely by the fact that the study was made after they had had the advantage of more than half a year of schooling. Hall inferred, as a result of this study, that there is little knowledge which the teacher can assume the child possesses at the beginning of his schooling, and that the concepts most common in children of a given locality are acquired first, while the rarer ones are acquired later. Children from better neighborhoods, as a rule, have fewer misconceptions than do children from the poorer districts, owing primarily to the more accurate information the former group receives as compared with the latter.

Huff (1927) followed along the general lines of the study made by Hall to discover the percept content of the minds of children from kindergarten to high school. The weakest percepts, Huff reported, were as follows: in 45 to 49 per cent of cases, errors occurred in the percepts of growing wheat, hoe, source of sugar, beach, and what makes the clock go; 40 to 44 per cent, in the case of beehive, growing grapes, source of silk, island, and water in faucet; 35 to 39 per cent, in the source of copper wire and gas in the stove. When different factors influencing the child's percepts were examined, Huff concluded that the most important single factor was environment, as shown by the fact that the percepts best known were contiguous to all children, while those least known were not part of the experiences of the children.

Illusions.—Illusions are errors of perception of a large and unusual type. In them, the individual associates wrong meanings with what he observes, and hence the source of error is in association rather than in observation. While all individuals are, at some time or other, subject to illusions, young children are especially susceptible to them because they lack the critical attitude that one finds in older children or adults. As a result of this, the child may readily associate completely wrong meanings with what he observes, without realizing how incongruous this may be.

Laboratory studies of illusions in children show how erroneous their observations sometimes are. Using a series of brass tubes of different sizes but of the same shape and weight, Dresslar (1894) asked children to arrange them in the order of their weight. More than half of the children arranged the weights in the exact order of their size. The illusion was very large when the child was asked to judge the weights to be placed in the

position of the heaviest or the lightest. When children, from grades four to eight, and university students were asked by Wolfe (1898) to reproduce from memory, on paper, the size of familiar coins, such as a quarter or dime, it was noted that young children rather consistently underestimated the sizes, while adults seemed to overestimate them.

Variations in Errors.—While it is true that all perception is subject to error and that the extent of the errors is closely related to the age of the individual, there are nevertheless errors within each age group, depending more upon what is observed than upon the abilities of the subject to observe or the opportunities he has had to acquire information. As a general rule, it may be said that the more subjective the perception, the more influenced it is by personal bias or prejudice which, in turn, results in faulty concepts. Objective facts, on the other hand, may be observed incorrectly because of insufficient knowledge on the subject's part to enable him to perceive them correctly.

Specific illustrations will clarify this point of view. If the child's concepts of rain, the origin of butter or God, or the function of the heart are incorrect, one may be certain that in most instances the misconceptions are caused by faulty or inadequate information, which the child has acquired from his contacts with others or from reading. Faulty concepts about the self, on the other hand, are not caused by faulty information but rather by personal bias. The child, like the adult, prefers to think of himself as he *would like to be*, with traits and characteristics that are approved by the social group. If asked, then, to judge himself, he will do so in terms of the ideal self rather than in terms of the real self. This, Hurlock (1927a) noted to be the case when school children were asked to check one word in each pair that more nearly described him, such as:

Careful.....	Careless
Daring.....	Ambitious
Patient.....	Impatient
Generous.....	Stingy
Cowardly.....	Brave

A small group of adults was then asked to analyze the list of descriptive terms and mark the word in each pair which the child, because of home or school training, would be apt to consider undesirable. In Table XLII are given the percentages of undesirable responses for both boys and girls.

Of the 12,690 responses made by a group of 423 children, only 763, or 6 per cent, were related to socially undesirable traits. Of these, *proud*, *daring*, and *bad tempered* were chosen most often and *stingy*, *distrustful*, and *cowardly* the least. Boys, on the whole, tended to mark more of the socially undesirable traits than did girls. There seemed to be a

decided tendency for the children to overestimate the presence of traits which are socially desirable and to underestimate the presence of socially undesirable ones. This tendency is more pronounced as children grow older and become increasingly aware of the opinions of others.

TABLE XLII.—PERCENTAGE OF FREQUENCY OF CHOICE OF UNDESIRABLE DESCRIPTIVE TERMS

Undesirable traits	Percentage of terms chosen	
	Boys	Girls
Careless.....	8.5	14
Daring.....	23.7	6.1
Unambitious.....	3.3	.9
Selfish.....	1.9	5.6
Tardy.....	5.2	1.8
Bad tempered.....	12.8	13.2
Inaccurate.....	4.7	7.7
Lazy.....	1.4	1.9
Vain.....	5.2	4.7
Changeable.....	12.3	9.9
Indifferent.....	3.2	.9
Yielding.....	2.8	5.2
Distrustful.....	1.9	.9
Cowardly.....	0.9	1.9
Stupid.....	0.9	1.9
Bad memory.....	6.1	4.2
Self-distrustful.....	2.8	2.8
Hasty.....	12.3	10.4
Unobservant.....	2.8	2.3
Unsociable.....	3.3	3.3
Disorderly.....	4.1	2.8
Gloomy.....	2.3	4.3
Impatient.....	10.9	7.1
Slow in thought.....	7.1	7.0
Slow in movement.....	4.2	2.3
Holds a grudge.....	2.9	3.3
Fond of fight.....	15.1	7.1
Extravagant.....	7.1	4.7
Proud.....	35.5	17.0
Stingy.....	0	0

Source: HURLOCK, E. B. A study of self-ratings by children. *J. appl. Psychol.*, 1927, 11, 490-502.

CHAPTER XII

MORAL DEVELOPMENT

THE NATURE OF MORALITY

Morality is conformity to the moral code of the social group. The term comes from the Latin word "mores," meaning manners, customs, or folkways. To act in a moral way means, thus, to act in conformity to group standards of conduct. Immorality is failure to conform or behavior directed against the interests and welfare of the group. Unmoral or nonmoral behavior, on the other hand, is behavior which, even when unfavorable to the group, is so, not because of intended harm on the part of the individual, but rather owing to ignorance and lack of knowledge of what is socially approved.

Morality may vary from one group to another, depending upon what has been accepted by the group as the socially approved form of behavior. Even within a community, different social classes often have their own individual codes of approved behavior which differ markedly from those of the other social classes of the same community. Moral behavior, thus, is a matter of what the group to which the individual belongs believes is right and therefore gives its approval.

Morality Is Learned.—The baby is neither moral nor immoral. He is nonmoral in the sense that his behavior is not guided by moral standards. Before he can behave in a moral way, he must learn what the group to which he belongs believes to be right or wrong. This he will learn gradually through the childhood years, partly from the teachings of parents, teachers, or others in authority, and partly from imitating the behavior of those with whom he most often comes in contact.

No child can be expected to build up a moral code of his own. He must be taught the standards of right and wrong as they are handed down from one generation to another. He must learn the moral concepts which the social group has found to be useful through successive years. It must not be left to his discretion to decide what is right or wrong, nor should he be permitted to act as he pleases, without considering the group.

The lawmakers set the pattern for the moral behavior of the child. Parents and others who are responsible for the guidance of the child's development must then help the child to learn to conform to this pattern. If the socially acceptable pattern of behavior is accompanied by satisfaction, it will be repeated and in time become habitual. Eventually, with proper guidance and training, the child should conform to moral

standards of right without external force. It is desirable that the child's behavior be voluntary rather than dominated by force. This can be accomplished only after the child has learned to distinguish between right and wrong and has built up a desire to do what the group considers right, because of anticipated social approval or reward.

True Morality.—True morality is behavior which conforms to social standards and which is also carried out voluntarily by the individual. It comes with the transition *from external to internal authority* and consists of conduct regulated from within. It is accompanied by a feeling of personal responsibility for the act. Added to this, it involves giving primary consideration to the welfare of the group, while personal desires or gains are relegated to a position of secondary importance. Because true morality is so highly developed and so complex, it is rarely ever found in children. It should appear during the adolescent years, but whether it does so or not will depend to a large extent upon the type of moral education the child has been given.

Moral development of the highest type involves two aspects, the *intellectual* and the *impulsive*. The child must learn what is right and what is wrong, and as soon as he is old enough he must understand why it is so. In addition to this, he must develop the desire to do what is right, to act for the common good, and to avoid wrong. This can be accomplished most successfully by associating pleasant reactions with what is right and unpleasant reactions with what is wrong. To ensure the child's willingness to act in a socially desirable way, the child must receive the approval of the group. In addition to that, he must have plenty of opportunities to take part in group activities, so that he can learn what the group expects.

PHASES OF MORAL DEVELOPMENT

Moral development has two phases, separate and distinct, but both essential if true morality is to be attained:

(1) The *development of moral behavior* and (2) the *development of moral concepts*.

1. DEVELOPMENT OF MORAL BEHAVIOR

It takes a young child many years to learn to act in a manner approved by the social group. The whole purpose of discipline is to teach the child what is right and to see to it that he acts as society expects him to act. If discipline has been of the right type, and if it has been used consistently, instead of in a haphazard manner, ethical conduct sooner or later becomes habitual. When pleasant associations, in the form of praise, social approval, and reward, are tied up with socially desirable behavior, ethical conduct is learned more quickly than it otherwise would be.

Teaching the child what is right and wrong is not enough. He may, as a result of teaching, have a wide fund of moral concepts, but he cannot be expected to apply his moral knowledge to meet concrete experiences in everyday life. For that reason, he must be guided in the development of habits of action. The child may know, for example, that it is wrong to cheat in school, to take money from the mother's pocketbook, or to lie to escape punishment for wrongdoing. But his knowledge is limited to abstract concepts, and he cannot be expected to apply it to specific situations until he is old enough to see of his own accord the relationship between concept and specific situation.

The experimental studies of Hartshorne and May (1927, 1928) (described in detail on page 328) have shown conclusively that young children must learn moral behavior in specific situations, and that they cannot be expected to apply moral concepts, learned in the abstract as "ideals" or "examples," to specific situations. Transfer of knowledge of right or wrong conduct comes only when situations are similar enough for the child to see relationships in them. The correlation between deception score on tests of the same type, as arithmetic and vocabulary tests, Hartshorne and May found to be $+.696$ as contrasted with the correlation of $+.198$ between cheating in school and cheating in athletic contests. These results suggest that moral behavior in children consists of habits learned in special situations which will function only in similar situations.

How Moral Behavior Is Learned.—From this we may conclude that learning to behave in a socially acceptable manner follows the same laws as all other forms of learning. The child must *first learn to make correct specific responses in specific situations*. He learns, as a little child, to conform to standards of conduct in the home. Later, when he goes to school, he learns to conform to the school's standards, and when he becomes a member of a play group, he conforms to the standards of that group. Should the standards of the home, the school, and play group all agree, it will be easy for the child to see the similarity *and thus*, in time, *develop abstract concepts* of right and wrong. If, however, they differ from one situation to another, the child is confused and wonders why he is punished for an act which in another situation was ignored or looked upon as socially acceptable.

Of even more serious consequences, a condition of this sort makes it impossible for the child to develop moral concepts that will hold for the same act in different situations. If, for example, the child is permitted to sneak cake from the cake box or candy from a box which he has been told not to touch, is it surprising that he is confused when he is punished for taking pencils from other children's desks at school or money from the mother's pocketbook? Stealing should be regarded as wrong in every

situation and should be punished consistently, if the child is to learn to behave in accordance with the codes of adult society.

Transfer of training experiments have shown that transfer comes only when situations are similar. This is likewise true of moral training. When the objective aspects of a situation are the same, transfer can be expected to occur. When they are different, it is questionable whether or not transfer will take place. Will the child, for example, who learns not to take money from a pocketbook transfer this habit to cash registers? The objective features of the two situations are different, and consequently the child may not see the common features of the two which are so obvious to an adult.

Moral training should therefore involve teaching the child to look for *common features of apparently different situations*. This, of course, involves analysis of a too complex sort to expect in a young child. But the child of eight or ten years of age can be taught that it is wrong to take money belonging to other people, whether it comes from their pocketbooks, from their desks or bureau drawers, or from a cash register. It is in this way that moral training can lead to the development of moral concepts of a general rather than of a specific sort.

Essential Principles.—Learning to behave in a moral way is thus too complex to be left to chance or to the young child's trial-and-error experiences. It involves four fundamental principles: (1) it must be directed along *socially desirable lines*; (2) the child must be *told directly what is right and what is wrong*; (3) as soon as he can understand, he must be told *why* certain things are right while other things are wrong; and (4) there must be a conscious attempt on the part of those who direct the child's behavior to *associate pleasant reactions* with behavior that is *right* and *unpleasant reactions* with behavior that is *wrong*.

In the psychological study of habit building, we know that in the establishment of any habit it is essential that no exceptions be allowed to occur until it is well learned. Now, this is true of moral habits as well as of all other habits. For that reason, moral training must be consistent. The acts that are wrong must be wrong tomorrow as well as today, not wrong one day and right the next. Unless consistency be maintained, the child is sure to be confused. Many so-called "problem children" are the result of inconsistent discipline. The child becomes maladjusted because he does not know what is expected of him.

2. DEVELOPMENT OF MORAL CONCEPTS

The second phase of moral development consists of the learning of moral concepts, or the principles of right and wrong in an abstract, verbal form. This, of course, is too advanced for a young child, and it is therefore necessary to wait until the child has the mental capacity to

generalize and transfer a principle of conduct from one situation to another, before he can be expected to learn moral concepts. It is true that language skills make this easier, because concepts are derived from concrete cases. Nevertheless, the child must be mentally mature enough to see the relationship between an abstract principle and concrete cases and to associate these with memory images of specific situations.

The child learns to judge his own conduct as "good" or "bad" in terms of the consequences of his acts. If his training has been of a consistent sort, he soon learns to judge a certain act as "bad" because punishment of one sort or another invariably follows the act. Another act, on the other hand, is judged as "good" because invariably praise or some other form of social approval accompanies it.

As he grows older, he must learn to judge his behavior in terms of the social consequences, regardless of personal consequences. He thus thinks of how the group will judge his behavior and not how he himself will be affected by them. In the gang age, for example, telling tales on the gang to parents or teachers may give the child a temporary personal satisfaction because it puts him in the limelight. But he soon discovers that the members of his gang regard this with great disfavor, and it therefore becomes a "wrong" thing to do.

Value of Social Contacts.—No child can be expected to learn to make moral judgments of a mature type unless he is given an opportunity to do so by associating with others. Through contacts with others, he has an opportunity to see how they evaluate his behavior. It is especially important that he have plenty of contacts with both adults and children who are not members of his family and who will not make allowances for his behavior as members of his family are apt to do. Learning to judge one's own conduct and that of others comes through actual personal experiences and not through moral teaching or "preaching" of right and wrong.

General Moral Concepts.—Concepts are at first specific and relate to the specific situations in which they were learned. As the child's capacity for comprehending relationships increases, his concepts of right and wrong in different though related situations merge. As a result, general concepts are gradually learned because the child is able to recognize a common element in a variety of situations. In order to do this, the child must have actual personal experiences with real situations. He cannot be expected to understand general moral concepts if they are taught to him as such and consequently have little meaning because of their lack of association with real experiences.

One of the greatest difficulties the child experiences in learning moral concepts comes from the fact that they often vary with situations, and these differences are too subtle for a child to understand. It is very difficult for him to comprehend, for instance, why it is wrong to take a

cookie from a box in a store when he is permitted to help himself at the cookie jar at home. Likewise, he cannot understand why it is wrong to take money put in his bank when it is all right to use money from his pocketbook. In both cases, he argues, the money is his.

Experimental Studies of Moral Concepts.—A number of experimental studies of children's moral concepts have been made. These have shown that the comprehension of moral concepts is closely related to general maturity and intelligence. Macaulay and Watkins (1926) asked 2,500 children to make a list of the most wicked things anyone could do. They found that, up to the age of nine years, the child's concepts were definite and concrete rather than abstract. They were in terms of the child's immediate personal relationships, such as disobeying mother or hurting the cat. After nine years of age, the concepts became more generalized as, for example, stealing is wrong, rather than it is wrong to steal a ball. Moral concepts are well developed in adolescence, Slavens and Brogan (1927) found when they had high-school students rank moral traits in the order of degree of badness. The moral concepts of high-school students were found to be very similar to those of university students.

Experimental studies have revealed that the discrepancy between moral concepts and moral behavior is greater than it is popularly believed to be. Hartshorne and May (1928) found that abstract knowledge of what is wrong did not keep school children from cheating when the particular situation arose in which they were tempted to cheat. In the case of 933 pupils who copied from keys in school tests, 89 per cent stated that they believed it was cheating to copy from the keys. In Fite's (1940) study of nursery-school children's attitudes toward aggressive behavior, there was found to be no consistent relationship between what the children had to say about the "rights" and "wrongs" of aggressive behavior and the degree of aggression they showed toward the children in the playground.

Discrepancy between moral concepts and moral behavior is well illustrated in the case of delinquent children. While these children often know that certain acts are wrong, they persist in behaving in an unsocial way. Bartlett and Harris (1935) found a high correlation in knowledge of accepted moral codes among high-school students and delinquents. When he asked 128 reformatory girls to rank in order of badness 16 bad practices, Weber (1926) found that they showed as much moral insight as was shown by a group of university women used for a control group.

Hill (1935) compared the ethical knowledge of delinquent with non-delinquent boys as measured by a test made up of descriptions of social situations and acts to be rated as "right" or "wrong." Sample items were killing in self-defense; boy quitting school; not paying taxes when able; breaking quarantine; and booing officials at a game. The results

showed a high degree of general agreement between ethical knowledge of the offenders and nonoffenders. The general conclusion that may be drawn from studies of this sort is that knowledge of right and wrong is not a deterrent to misbehavior or criminality.

STAGES IN MORAL DEVELOPMENT

The moral development of the child, like other phases of his development, follows a pattern in which certain types of morality may be expected to appear at different periods in the growth of the child. There is no sharp dividing line between the different phases of development. Rather, the development is graded and the transition from one period to another occurs slowly and over a period of months.

Many attempts have been made to divide the moral development of the child into distinct stages. Only three of these will be given as samples. McDougall (1923) has recognized four levels of conduct. These are: (1) *Unlearned or instinctive behavior*, modified by the natural consequences of the act. This appears in early babyhood, and partially throughout life. (2) *Level of reward and punishment*, administered by parents, teachers, and others. This is the level of external control, which extends up to puberty. (3) *Level of social approval and disapproval*, in which group opinion is a powerful motivating force. (4) *Level of altruism*, in which the individual acts for the common good. This is the highest, and the true level of morality.

The five levels of moral development recognized by Piaget (1932) are as follows: (1) *habit level*, in which emotional satisfactions are prominent; (2) *conformity to adult requirements*; (3) *mutual adjustment of equals*; (4) *appreciation of underlying motives*; and (5) *codification of rules, principles, and ideals*. A third attempt to divide the moral development of the child into specific stages was made by Dewey and Tufts (1932) who recognize the three following levels: (1) *behavior motivated by various biological, economic, and other nonmoral impulses and needs*; (2) *behavior following the mores of the group* but manifesting very little reflection; and (3) *behavior based upon individual judgment* and involving criticism of group conduct.

In the analysis of stages of moral development presented below, there will be no attempt to follow specifically any one analysis. Instead, the approach will be to discuss the characteristic moral development in each of the important developmental stages and to stress the progress toward mature moral standards from one age to another.

1. MORALITY IN BABYHOOD

The baby, as was pointed out in the beginning of the chapter, is neither moral nor immoral. He is *nonmoral*. The old-fashioned religious point

of view was that the child was "burdened with original sin" which had to be purged from him by corporal punishment; and some individuals went to the opposite extreme and believed that the baby was born good but was corrupted by worldly influences. Neither point of view is correct. The child is not born with good or bad moral standards. He must learn to act in ways which are judged to be good by the social group and to refrain from doing what the group considers wrong.

To the baby, standards of right and wrong as accepted by the group mean nothing. His behavior is guided by impulse, and he judges right and wrong in relation to the pleasure or pain the act affords him rather than in terms of the good or harm done to others. The baby is too young, intellectually, to realize that an act is wrong unless ill-effects follow. He thinks only of how this behavior affects him personally, and he feels no obligations to modify his behavior because of others, unless his behavior is accompanied by unpleasant consequences.

A "guilty conscience" from wrongdoing is unknown at this age because it requires the development of definite standards of right and wrong. By the age of three or four years, however, the child whose discipline has been consistent knows what is acceptable, and therefore right, and what is disapproved of, and therefore wrong. Likewise, a sense of duty or obligation to others is lacking. The baby does what pleases him, regardless of how it affects others. Nor does he think of doing things to please others. Even though his act may cause distress or pain to another, he has no feeling of remorse.

At this age, standards of property rights are unknown. The baby takes things which please his fancy, regardless of ownership. A toy in a shop or in another child's house may easily be carried off by the baby, should it happen to appeal to him. No thought of stealing enters into the act. Even when he is told not to touch things that belong to others, he forgets when a new and different object arouses his curiosity. The more consistently the baby is told not to touch something because it is "mother's," or not to touch another object because it is "Mrs. Smith's," the sooner he will learn to respect the property of other people.

2. MORALITY IN EARLY CHILDHOOD

From three to six years of age, the foundations of moral conduct and the basic moral attitudes of the social group should become established. At this time, the child is not told why this act is right or wrong, but he is merely told how to act, and he knows that, unless his behavior conforms to standard, he will be punished. Because of his mental immaturity and limited experience, the child cannot be expected to understand the

why and wherefore of rules. He can, however, comprehend the magnitude of the various offenses because of the severity of punishment associated with the acts.

The unmoral character of the child's conduct is apparent in the fact that the child conforms to the conduct standards set by his environment, as a means of avoiding social disapproval or punishment, or to gain social approval and reward. This leads him to do what is right without actually knowing why he acts as he does. By the time the child is five or six years old, habits of obedience should be established, provided, of course, that the child has had consistent discipline. If his acts are bad, it is more often from ignorance than from willful disobedience.

Concepts of right and wrong are being established at this age through the association of such words as "good," "bad," "naughty," and "nice" with specific acts. These associations come from rules laid down in the home relating to specific acts and situations. The young child learns that certain forms of behavior are "good," while others are "naughty," and that praise or reward follows the former, while scoldings or punishment follows the latter. He soon comes to regard behavior in terms of "good" or "bad," and thus specific moral concepts are established. This shows a definite awareness of the mores of the group, even though the group is limited, for the most part, to his family. The discrepancy between moral concepts and moral behavior is marked at this age. Even though right and wrong are expressed in words, they are often not followed by actions related to them.

The child may rebel against adult authority; he may try to evade the rules of conduct laid down by the adults of his environment; and he may try to test out their authority by attempting to "get away with" forbidden acts; but he does not, at this age, question the justice of the rules. He does not even suggest the possibility of alternatives of the act, as the older child does. He merely obeys or disobeys the rules, but he does not bring up the question of whether or not he will be permitted to substitute an act more pleasing to him for an act which he is expected to perform. If, for example, he has been taught that it is wrong to take home a toy belonging to another child, he either does or does not take it. He never brings up the alternative of "borrowing it for a few days and returning it later."

Before five or six years of age, the child does not feel guilty when he does what is wrong. When caught in a wrong act, the child will become embarrassed, frightened of possible punishments, or will rationalize to explain why he behaved as he did. If, on the other hand, he is not caught, he will not bother about his wrong act, nor will he feel guilty because he has acted in contradiction to what he knows is right.

3. MORALITY IN LATE CHILDHOOD

The moral code of the older child is determined to a large extent by the moral code of his gang. The boy or girl, from six years of age to adolescence, learns to behave as the group expects him or her to behave and conforms rigidly to the group's standards of right and wrong. By ten or twelve years of age, the child can understand the underlying principle and reason for rules. He has the ability to make moral discriminations, and he has a large fund of verbal morality, or learned concepts of right and wrong as they relate to different situations. He lacks true morality in that he is unable to judge for himself whether an act is right or wrong but must rely on what he has learned in regard to it.

The older child, provided the basis of morality has already been established, has a strong sense of justice and honor. He believes that it is wrong to lie, to carry tales, to be cowardly, to abuse the small or weak individual, to take things belonging to others, or to betray one's friends. He is contemptuous of those who lie, cheat, or steal, if his group believes such acts to be wrong, and his standards of honor are rigid and unalterable. He will strongly condemn anyone whose behavior falls below his standards of morality, and his contempt for the transgressor is expressed in no uncertain terms. His attitude toward those who do not conform is one of pronounced intolerance.

The older child's attitude toward laws was studied by Lockhart (1930, 1930a) in the case of boys and girls from grades four to twelve, and 50 adults, by means of a law-attitude test. Lockhart found that children's attitude gradually approached the adult attitude as they advanced through the grades. Sex and socioeconomic status proved to be of no consequence in producing differences in the attitude toward law. A lawless attitude, he found, was a problem of the individual and not one of social, economic, or intellectual level.

While condemning others for violating rules, the older child will often question the justice of the rules. Should the gang leader take the position that a certain rule is "unfair," the gang as a whole will take sides with him, and a stormy protest will be the outcome. The gang will then champion the cause of the offender, and treat him as a martyr who has been subjected to unfair treatment.

Misdemeanors.—A misdemeanor is mischievousness, disobedience, or willful badness of a minor sort. Misdemeanors increase throughout the gang age and reach their peak shortly before adolescence. At this time, the child is making a transition from parental to group authority, with the result that in many cases there is a lessening of external control over his behavior. There are many different forms of misdemeanor at

this age, the six most common in elementary-school children, Wickman (1929) found to be whispering, inattentiveness, carelessness in work, "tattling," disorderliness in class, and interrupting in class. The six that occurred least were truancy, temper outbursts, stealing money, stealing food, writing obscene notes, and smoking. One of the important conclusions from Dickson's (1932) study is that "those things which cause the most disciplinary troubles to the average teacher are natural to a normal child. . . . To put it in other words, the child who has not behavior difficulty is not normal."

Children's Lies.—One of the most extensively studied forms of misdemeanor in children is lies. Leonard (1920) analyzed nearly 700 lies of children and found that 68 per cent were due primarily to fear of punishment, disapproval, or ridicule. About 12 per cent were due to childish imaginings, exaggerations, and inaccuracies, while the remaining 20 per cent were willful inventions, intended to deceive.

Morgan (1931) has classified children's lies into seven types: (1) the playful lie, due to the make-believe play of imagination; (2) the lie of confusion, owing to inability to report accurately the details of some incident or to the beclouding of the issue by suggestions of another; (3) the lie of vanity, designed to draw attention to one's self; (4) the lie of malevolence or revenge, motivated by hate; (5) the excusive lie, resulting from fear that follows rigid discipline; (6) the selfish lie, which is calculated to deceive others so that one may get what he wants; and (7) the loyal or conventional lie, to safeguard a friend.

Occasionally boys and girls at this age will lie or blame others to avoid the punishment they know they deserve because of a wrongdoing willfully carried out. A small percentage of children, usually boys, considers it "smart" to try to "get away with" wrongdoing without being punished for it. This attitude is fostered by an environment in which adolescents or adults boast about their success in escaping punishment for wrongdoing or by an environment in which the child is actually taught to believe that it is all right to do a wrong thing provided one is clever enough to "get away with it."

Dishonesty.—Dishonesty, in forms other than lies, appears in the preschool years, but it is more pronounced late in childhood. Boys and girls learn, from their own experiences or from those of their friends, ways and means of deceiving others, especially parents and teachers. They may pretend to be ill to avoid carrying out an unpleasant task; they may hide objects broken unintentionally or pretend that someone else did it; they may feign ignorance of a rule which they have broken; they may cheat in school work or athletics; or they may steal. All these forms of dishonesty are found in childhood; and few children are free from dishonesty in one form or another.

Hartshorne and May's Study.—One of the outstanding experimental studies of dishonesty has been made by Hartshorne and May (1928), who investigated dishonesty in the case of nearly 11,000 school children of different cultural, socioeconomic, and intellectual levels by means of a number of tests designed to measure honesty and dishonesty in an objective way. These tests gave the children opportunities to cheat in classroom work, in school work done at home, in athletic contests, and in parlor games. A few illustrations of the test situations used will show how honesty was tested by them.

To measure cheating in the classrooms, Hartshorne and May had children give answers to arithmetic problems on the margin of the test papers. The papers were then collected and a duplicate made of each paper. The papers were returned to the pupils at a later session of the class, and each pupil was asked to score his own paper by using a key or answer sheet given to him. Deception consisted of illegitimately increasing the score by copying answers from the key. A test of cheating in parlor games, such as pinning the tail on a donkey, consisted of adjusting a bandage in such a way that the blindfolded child could see the floor under the bandage. This enabled him to follow the floor boards and look at the donkey so that he could pin the tail on it very accurately, which, however, could not be accomplished unless the child peeped.

A few of the important findings of this study are as follows: In general, there is no outstanding sex difference in cheating, though in some of the tests a sex difference appeared. Older pupils are slightly more deceptive than are the younger ones. When children are classified into occupational levels, according to socioeconomic status, those at the highest level deceived the least, and those at the lowest level, the most. Children of the higher levels of intelligence deceived definitely less than did those of lower intelligence. Children who were friends showed more than a chance resemblance in the amount of cheating they did. In the same test or very similar tests, the correlation of the scores was high but became lower as the test situations became more different. This would suggest that there is no generalized, uniform trait of honesty that characterizes the child in all his activities. Honesty and dishonesty are dependent to a large extent upon the situation itself, and the child's motives in regard to it, rather than upon a generalized moral trait.

4. MORALITY IN ADOLESCENCE

By the time the individual reaches adolescence, his conduct is regulated partly by social approval and disapproval and partly by consciously thought-out standards of right and wrong. As was true during the gang age, the approval and disapproval of the social group has a powerful

influence on the conduct of the adolescent. Now, however, instead of limiting the group to his immediate circle of friends, it is broadened to include the community at large. The force of social approval and disapproval is especially great between the sixteenth and eighteenth years. At this age, adolescents discuss moral problems with one another and formulate rigid codes. Later, as a result of increased knowledge, the adolescent thinks for himself and establishes his own code of morality.

The development of a code of behavior thought out by the adolescent is the result of training in the home and school and of the influence of the gang in the years preceding and during adolescence. That means that if the adolescent is to have a desirable code of conduct, he should not only have guidance and advice in planning this code, but he should have a good model to copy in the conduct of his elders and his friends. It is not surprising to find that the adolescent glories in lawbreaking when the adults and other adolescents with whom he associates boast of their ability to "get away with things."

The adolescent loves right for its own sake rather than for any material gain. This is often so intense that it leads to acts involving great personal sacrifice, without any thought of personal recompense. Even after he discovers that he is gaining nothing from it and may even be losing the friendship of his associates, the adolescent reformer continues his campaign of reform.

The moral code of the adolescent is usually rigid and unbreakable. He is critical of those who fall below his standards and of those who break the rules of the game. Introspective analysis of his own good and weak traits, which shows how far short of perfection he himself falls, often leads to self-condemnation and despair. In many instances, the moodiness of adolescence may be traced to the discouragement which comes when the adolescent realizes the difficulties involved in the attainment of perfection he expects in others as well as in his own behavior.

In contrast to this attitude, it is not at all an uncommon thing to find that both adolescent boys and girls revolt against existing rules and laws and engage in wrongdoing, often as extreme as the rigidity of their moral codes. One cannot expect perfect behavior at this age, because the adolescent is impulsive and acts on the spur of the moment. His wrongdoing may result from his not seeing the relationship between a new act and old ones that are bad or from the influence of undesirable companions. Whatever may be its cause, the peak of the criminal curve for adolescence occurs between the ages of fifteen and seventeen years and coincides with the period when the adolescent wants to do good, to bring about social reforms, and when he is most critical in his judgment of others. Until the end of the adolescent years, there is instability in the adolescent's behavior and a shifting from one extreme to another.

How conventional the adolescent is, and how apt he is to conform to moral standards, even though he may question them, was brought out in the study made by Dudycha (1930) to investigate the moral beliefs of college freshmen. He gave a list of 25 moral propositions taken from conventional codes to 98 college freshmen, such as: (1) "It is one's duty to lead a clean personal life." (5) "Honesty is the best policy." (13) "It is wrong to have promiscuous sexual relations." (24) "It is morally wrong for women to smoke." He found that each student implicitly believed on an average of 67 per cent of these, believed 10 per cent, was noncommittal on 9 per cent, was inclined to disbelieve 3 per cent, and absolutely disbelieved 11 per cent. There was thus a decided tendency to believe the moral propositions presented. Disbelief was greatest in the case of propositions relating to smoking in men and women.

DISCIPLINE

Discipline means training to conform to accepted standards of behavior. This consists of guiding the activities of the individual into desirable channels through positive motivation and inhibiting undesirable activities through negative motivation. It is necessary to train the child to suppress socially undesirable motives, as fighting and stealing, while at the same time encouraging the development of socially desirable ones.

Principles of Discipline.—Discipline consists primarily of habit formation and thus involves four essential principles. (1) The child must act in a desirable manner and eliminate undesirable behavior; (2) he must associate satisfaction with desirable and dissatisfaction with undesirable acts; (3) he must make the desirable act so automatic that it will, in time, be repeated of its own accord without need of supervision; and (4) he must learn to substitute desirable for undesirable behavior.

Even though positive motivation, in the form of reward, brings better results than negative motivation, in the form of punishment, punishment should not be eliminated. The recognition of the possible consequences of an act is essential to all moral behavior. This involves the ability to foresee what will happen if an undesirable act is carried out—an ability which is not found in individuals of low-grade intelligence. Because the recognition of possible consequences of an act necessitates an evaluation of the act, every child must learn to weigh alternative acts with consequences associated with each. He thus learns to decide for himself whether the act is worth its "price tag."

Function of Rules.—Rules and laws serve two useful purposes in discipline. (1) They act first as an educational agency, to acquaint the child with the standards of conduct that are acceptable to the group, and (2) they are restrictive in that they restrain undesirable behavior. By the adolescent years, provided discipline has been of the right sort, rules

and laws should not be needed. But, if they were not used, many individuals would quickly lapse into unsocial behavior. They thus serve as a preventative to antisocial behavior.

Types of Discipline.—Ayer and Bernreuter (1937) analyzed eight types of discipline to see what effects they had on the personality of



FIG. 51.—Stubborn resentful response to punishment. (From L. H. Meek, *Your child's development and guidance told in pictures*. Lippincott, 1940.)

nursery-school children. The types of discipline studied included physical punishment, isolating or ignoring the child, natural result of the child's act, worry (scaring the child and thus making him afraid or worried), rewards or promised rewards, doing the first thing that pops into a parent's head, temper (on the part of the parent to get the child to do what is wanted), and penance (such as making the child sit on a chair or

go to bed). Of these, they found that isolation, physical punishment, and "natural results of a child's act" were the most frequently used.

An evaluation of the different methods showed that the more physical punishment is used on children, the less they tend to face reality and the more they depend on adult affection and attention. "Natural results of the child's acts" proved to foster attractive personality and independence of adult affection or attention. Scolding or making the child afraid tends to make children unattractive and dependent. Using temper, extracting a penance from the child, or doing the first thing that pops into the parent's head tends to make children less attractive, less able to face reality, and less sociable. In conclusion, they contend that allowing the child to profit by the natural results of his acts is the most satisfactory form of discipline to use in the case of preschool children. Figure 51 shows the stubborn, resentful attitude caused by wrong forms of discipline.

PUNISHMENT AND REWARD

Punishment serves two major functions in discipline: (1) it acts as a deterrent to prevent repetition of socially undesirable acts, and (2) it acts as a means of showing the child what the social group regards as right or wrong. If it is to achieve the desired results, punishment must not act as an outlet for the pent-up anger of the person who has been offended or as a penalty for wrong deeds committed in the past. As the child's criterion of the seriousness of his offense is based on the severity of the punishment he receives, the necessity for consistent punishment should be apparent. Unfortunately, because most parents and other adults punish in anger, this criterion loses its value. If the child learns that inevitably a wrong act will result in a given punishment, he will think twice before carrying out the wrong deeds he may have contemplated.

Punishment is generally given to correct faults in behavior, without taking into consideration the child's motive. This obviously is unfair to the child. The adult who administers the punishment should make a definite effort to analyze the child's behavior in order to discover what motivated the wrongdoing. From the child's point of view, the fair thing is to tell him, as soon as he is able to understand, why the punishment is given. This not only emphasizes the educational value of punishment, but it eliminates the possibility of the child's interpreting it as due to personal annoyance on the part of the individual who administers the punishment.

Corporal Punishment.—Most adults think of corporal punishment, especially slapping the hands or spanking, as the most effective form of punishment to use in dealing with the wrongdoings of the child. Contrary to popular opinion, corporal punishment is one of the least satisfactory types because it rarely ever is actually associated in the child's mind

with the act for which the child is being punished. Because corporal punishment is generally administered when the adult is angry, it tends to condition the child to dislike the punisher. Since the anger of the adult is a more dominant factor in the situation than the act itself, the child tends to associate the whipper with pain rather than the wrong deed with pain. For that reason, the real value of this type of punishment is lost.

If corporal punishment is used, it should be administered while the act is going on and not delayed until a later time or left for someone else to administer. When the punishment is delayed, the association in the child's mind between the act and punishment is not made, and consequently the whole value of the punishment is lost. Corporal punishment, if used at all, should be used only up to the age when the child is capable of comprehending what is said to him, which is between the second and third years. After that time, a form of punishment more definitely related to the act should take the place of corporal punishment.

Other Forms.—Any form of punishment that has no direct relationship to the act is, like corporal punishment, less effective than a form of punishment that has a direct relationship to the act. For that reason, scolding, depriving the child of pleasure, isolating him from his playmates when the wrong act had nothing to do with them, putting him to bed without supper, or other similar punishments, are not as effective as the adults who use them expect them to be. It is far easier, it is true, to use some "stock punishment" regardless of the situation involved, and it requires far less ingenuity on the part of the user. But it does not serve its purpose as well as an individualized punishment would.

Instead of making a child stand in the corner for upsetting his milk willfully, he should be made to wipe it up. Similarly, if he intentionally breaks the toy of another child, he should be required to offer the child one of his toys to replace the broken one. Or, if he pulls the hair of another, his hair should be pulled so that he may know "how it feels." Punishments that are related to the act are sometimes hard to decide upon on the spur of the moment, but they are well worth the effort and ingenuity involved in planning them.

Punishment in Adolescence.—Punishment of adolescents generally takes a different form than the punishment of young children. Very rarely is corporal punishment used, and in most cases, the adolescent is subjected to a stock form of punishment which his parents found in the past to be effective. In a study of the home punishments of adolescent boys and girls, Stott (1940a) reported that *scolding* was by far the most common of the methods used. Other commonly used methods were being *made to stay at home* and being *slapped*. Only three of nearly 2,000 adolescents reported *whipping*, and all of these were farm children. Almost two-thirds of the punishings were done by the mothers, and boys

were punished more often than girls. Getting in late from a date, disobedience, being impudent or "sassy," and neglecting work were the reasons most often given for the punishment.

Improvement in Punishment.—Thorndike (1935) has suggested five ways in which it is possible to improve the results obtained from punishing the child. They are as follows:

The first is to try to make sure in each case that the punishment belongs to the behavior in question. . . .

The second is to forestall the punishment in cases where the want which led to the offense can be satisfied innocently.

The third is to shift the emphasis from the discomfort of A to the relief, security, and comfort of not-A, when it is prudent to do so, as it usually is.

The fourth is to search for ingenious ways of using the cue and almost fool-proof method of arousing the confirming reaction by attaching relevant satisfiers to the desired connection, in place of punishments for wrong connections. There are now homes in which the ratio of rewards to punishments for children from birth to fifteen years or later has been as high as 20 to 1, perhaps 50 to 1, with apparently excellent results. The motivation to learning in the primary grades of schools changed in a half-century from pain to pleasure to the great advantage of all concerned. If weakness and sentimentality can be avoided and sufficient ingenuity can be exercised, the management of men in all lines by the selection of their good tendencies rather than the repression of bad ones is a hopeful prospect.

A fifth is to arrange in a scientific, or at least a reasonable, manner the punishment which, even after the fullest use of rewards, will still remain as an important means of human control. Much of the use of punishments in the past has been doctrinaire, haphazard, fantastic and perverted. [Quoted by *perrot* 1931.]

Rewards.—Too much emphasis on punishment leads the individual to lose sight of the value of using rewards in the discipline of the child. If the child is to learn to act in a socially desirable way, it must be worth his while to do so. For that reason, rewards must be used to build up pleasant associations with the desired act. But this does not mean artificial rewards or "bribes" that have no relationship to the act.

Like punishment, rewards should have a direct relationship to the act that one wishes to have repeated, and in that way the pleasant associations will motivate the child to repeat it. Perhaps the simplest and yet most effective reward is social recognition in the form of praise. This can always be tied up with the act, as "You cleaned up your room very well, Johnnie." At the same time, it satisfies the desire on the part of every normal child for social recognition.

FACTORS INFLUENCING MORAL DEVELOPMENT

The moral development of children is influenced to a large extent by the type of environment the child has from earliest babyhood. Of the

many factors in the child's environment that influence his morality, the following are the most important:

1. The Family.—The influence of parents, as well as other members of the family, takes four distinct forms. (1) The family's behavior acts as a model for the behavior of the child, who imitates what he observes in others. (2) By the use of approval or disapproval, reward, or punishment, the family teaches the child to behave in a socially desirable manner. (3) By planning the punishment to fit the misdeed, the family can teach the child to recognize the severity of his wrongdoing. (4) The family can do much to motivate the child to do right.

Children under normal conditions look up to and admire their parents, relatives, and older brothers and sisters. If the conduct of these individuals is undesirable, the child will accept it as standard and behave in a manner disapproved of by the members of his social group. If, for example, adults boast about breaking traffic laws, or if they lie about illness to get out of a social obligation, the model of conduct thus set is far from desirable for the child to copy.

Experimental studies of the relationship between the child's moral concepts and those of the family have stressed the importance of the home environment. Hartshorne, May, and Shuttlesworth (1930) reported a correlation of .55 for moral knowledge scores in the case of parents and children, as contrasted with .35 for children and their Sunday-school teachers. This suggests that the child's ideas of right and wrong are more influenced by his parents than by his friends, teachers, or Sunday-school teachers.

Fite's (1940) analysis of the attitudes of nursery-school children toward aggressive behavior, determined by the child's response to pictures and to an experimental play situation in which boy and girl dolls were set to play in a playground made of blocks, showed the attitudes to be a direct representation of parental attitudes and of the rules of the home, as imposed by parents. Strong emotional responses occurred when requests were made for behavior definitely contrary to parental rules. Children's attitudes toward aggression, Fite concluded, thus proved to be the result of rules relating to aggression as laid down in the home. They reflected parental rules regarding specific home situations, such as behavior with siblings and the degree of certainty or confusion about aggression that the parents themselves expressed.

Studies of conduct disorders and delinquency likewise stress the importance of the home as a factor in determining the conduct of the child. Fernald's (1915) study of delinquent girls showed that 87 per cent of them came from broken homes or homes where the conduct example was of a definitely inferior sort. In an analysis of the conduct disorders of children brought to their clinics, Pavnter and Blanchard (1928) claimed

that poor home training and discipline were important causes of delinquency in 90 per cent of the cases. Broken homes, they found, were a contributing cause in 40 per cent of the cases.

2. Playmates.—When the child reaches the school age, a large percentage of his waking time is spent away from the home. As his contacts are more with children of his own age than with adults, it is not surprising to find that his playmates exert a tremendous influence over his behavior as well as his moral concepts.

Even in the case of nursery-school children, Fite (1940) found the influence of companions powerful enough to cause the children to deviate from parental rules in their attitudes toward aggression. With the development of "group feeling" came an increasing independence of adult rules, accompanied by an increase in the influence of group authority. Group authority, Fite noted, consisted of (1) patterns derived from adult rules, (2) patterns from experience in dealing with other children, and (3) patterns from other child groups resulting from criticisms of other groups. If the attitude of the group deviated markedly from the home pattern, a strong conflict on the child's part resulted.

Healy and Bronner (1926), in a study of delinquent children in Chicago and Boston, found that 62 per cent of the delinquencies were traceable to bad companions and only 13.5 per cent to feeble-mindedness. From his study of delinquents, Healy (1915) has concluded that companions play a very important role in determining the moral behavior of the child. Hartshorne and May (1927) found a correlation of .353 between children and their friends in moral concepts.

3. Schools.—Competitive athletics, which are so popular during the junior-high-school, high-school, and college years, offer splendid opportunities for moral training. Through sports, the boy or girl learns to be fair, to be a good sport, and to subordinate his selfish interests for the good of the group. Any behavior that does not measure up to the moral code of good sportsmanship will not be tolerated. Too much emphasis on winning, however, encourages the player to cheat. If he plays fairly and loses, he feels inferior and thus is tempted to cheat.

Through self-government, the older child or the adolescent learns to behave in a socially acceptable way. Schools that have inaugurated systems of self-government report that it does much to improve the quality of behavior of the student body as a whole, as well as to develop desirable moral concepts. This is not surprising, since the age when self-government is usable is the age when the gang plays a very important role in determining the child's moral behavior.

4. Sunday School and Church.—One of the responsibilities assumed by churches in the past was the moral education of the child. Today, owing partly to waning of interest in churchgoing and partly to a changed

attitude in regard to the functions of the church, the child receives little moral training from Sunday-school or church attendance. For that reason, the church cannot be regarded as a factor of major importance in the moral development of the child today.

From church, Sunday-school, or home instruction, the child learns that certain things are wrong because they are acts against God's laws and are therefore punishable in the life to come. Even though not caught, the child is often told that he will receive his punishment in due course of time. This differs from social enforcement in that it stresses God's disapproval and future punishment rather than present punishment of a tangible sort.

In studies of cheating, Hartshorne and May (1928) found that the children of their group who attended Sunday school had a slightly lower score for cheating than those who did not. The score for the Sunday-school-attending group was 31, compared with 40 for the nonattending group. Results in the White House Conference Report (1932) showed a relationship between church connections and delinquency. Of the 2,191 delinquent children studied, 37 per cent had no church connection, and 26 per cent attended only irregularly.

5. Books and Movies.—The effect of books on the moral concepts of the child is unknown. Because it is assumed by parents and teachers that the child's moral standards are influenced by the type of book he reads, careful supervision of the child's reading is considered important. Healy (1915) believes that the reading of bandit and other stories of a similar sort contributes to delinquency. The reading of good books, on the other hand, is believed to contribute to the establishment of desirable moral concepts, but how great this influence is cannot be determined experimentally.

A great deal of attention has been given to the problem of the effect of movies on the moral attitudes and behavior of the child. Just as movies influence the speech and dress of individuals, it is justifiable to assume that they will likewise influence the moral behavior. They help to mold the individual's outlook on life; they create desire for riches and luxury; and they suggest the case of crime. Because the child is very suggestible, especially during the adolescent years, careful censorship is essential if the child is to be kept from seeing movies of the type that will be detrimental to his moral development. Most states provide for a strict and carefully controlled censorship.

A number of experimental studies have been made to determine the influence of movies on behavior. Dysinger and Rucknick (1933), through the use of psychogalvanic response measurements, found that children under twelve years of age responded most intensely to scene of conflict, danger, and pseudo tragedy, while those near sixteen years of age

had the greatest reaction to love scenes or those suggestive of sex. Thurstone (1931) investigated the effect on the attitudes of children from grades nine to twelve of viewing a movie related to gambling and one related to prohibition. Children were found to regard gambling as more serious than they did before seeing the picture, while the prohibition picture had no measurable effect.

How movies influence crime and delinquency has also been investigated. Healy and Bronner (1926) have concluded from their study of 4,000 cases that in only about 1 per cent of the cases were the children motivated in their acts of delinquency by the movies. Hartshorne and May (1928) found a low correlation between attendance at movies and scores in cheating. In only about 10 per cent of the cases of delinquency among boys and 25 per cent among girls did Blumer and Hauser (1933) find that movies were of any influence. The indirect influence of the movies, they found, came through a display of criminal techniques, arousing a desire for easy money and luxury, stimulating intense sexual desires, or suggesting questionable methods of behavior.

INTELLIGENCE AND MORALITY

The relationship between intelligence and morality is important, but it is not as important as was previously believed. It is true that the child needs intelligence of a certain degree to be able to distinguish between right and wrong and to be able to foresee the consequences of his acts, but that does not necessarily mean intelligence of a superior level. Other factors than intelligence, as has been demonstrated in the preceding section, play a role of importance in determining the moral behavior of the child. Hartshorne and May (1928), for example, found a correlation of .50 between intelligence and honesty scores in the case of school children. This would suggest that there is little more than chance relationship between intelligence and honesty in the group they studied.

Studies of 1,000 children with I.Q. scores above 130 have shown them to be superior, Terman (1926) found, to a control group of the same size, made up of unselected children, in tests of honesty, truthfulness, and similar moral traits. The differences between the two groups were striking. Studies of delinquency have attempted to discover what percentage of the delinquent group is feeble-minded. Burt (1925), in England, found that 8 per cent of the 200 delinquents he studied had I.Q. scores below 70, while Healy and Bronner (1926) reported that 13.5 per cent of the 4,000 delinquents examined by them in Boston and Chicago were feeble-minded. Slawson (1926), in a study of delinquent boys from four institutions in New York State, reported that the intellectual deficiency of the delinquents was apparent mostly in the case of verbal abstract intelligence and less marked in nonverbal concrete intelligence.

JUVENILE DELINQUENCY

A juvenile delinquent is a child who commits an offense punishable by law. Any behavior which is so contrary to the laws and mores of the social group that it necessitates application crime-correction procedure is judged as "delinquency." It is estimated that 1 per cent of American children under eighteen years of age, or roughly 200,000 children, are brought to juvenile courts yearly. The prevalence of delinquency is greater than the statistics given above would indicate, because many delinquent children are never caught and brought to court. Statistics from the Federal Bureau of Investigation have shown that the largest number of arrests occurs at nineteen years.

Causes of Juvenile Delinquency.—The causes of juvenile delinquency may be divided roughly into two classes, the *predisposing causes* and the *motivating causes*. The first group paves the way for delinquency, by establishing an unfavorable attitude toward moral conduct. The second group, on the other hand, actually causes the youth to behave in a manner considered to be unlawful by the social group. These would not be powerful enough to lead to unsocial behavior if the youth were not already predisposed to misbehave.

1. *Predisposing Causes.*—Among the most important of the predisposing causes of juvenile delinquency are low-grade intelligence, emotional instability, physical or glandular disorders, poverty, poor home training, influence of bad associates, and an exaggerated sex urge. Any one of these alone would pave the way for delinquency, but when, as is often the case, several occur simultaneously, the chances for socially unacceptable behavior increase immeasurably.

Poor home training, bad associates, and poverty are a common combination of predisposing causes, as are low-grade intelligence, emotional instability, and physical or glandular disorders of one type or another. Hartshorne and May (1928) found that cheating in school was more common among children of inferior ability than among those of average or superior ability. They were tempted to cheat because of their inability to succeed on the basis of their own work. Healy and Bronner (1926), in America, and Burt (1925), in England, have found that defective family relationships, defective discipline, bad companions, and uncongenial school environments are common in combinations of predisposing causes of juvenile delinquency.

2. *Motivating Causes.*—The motivating causes of juvenile delinquency are varied and complex. Usually, dissatisfaction with present conditions and a desire for better things, as seen in homes of friends, in stores, or in movies, or as described in books, motivates the youth to criminal behavior. The appeal of easy wealth, and the desire for adventure, both of

which have not been satisfied in daily life, lead to criminal action. Delinquent behavior is thus a response to some *thwarted desire* on the part of the youth. How serious this behavior is depends to a large extent upon how strong the thwarted motive is and what has thwarted it.

Forms of Juvenile Delinquency.—The most common forms of juvenile delinquency are dishonesty, cheating, lying, stealing, truancy, vagrancy, intoxication, sexual delinquency, prostitution, and attempts at homicide or suicide. Up to fourteen years of age, delinquency consists mostly of offenses against property resulting from a desire for the fun and excitement that these give. To the older child or young adolescent, it is fun to

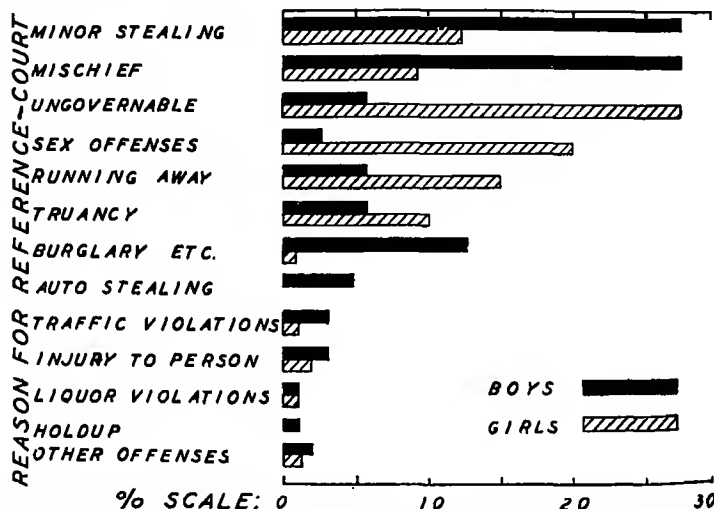


Fig. 52.—Relative importance of reasons for reference of boys and girls to 143 juvenile courts in 1931. Based on data of the United States Children's Bureau. (From F. K. Shuttlesworth, *The adolescent period*. Monogr. Soc. Res. Child Develpm., 1938, 3, No. 3.)

annoy others and to see if one can break laws without being caught. This shows a misdirected outlet for self-assertion which, if allowed to be repeated, will settle into a habit. Offenses against persons in the form of sexual irregularities, intoxication, suicides, and homicides are most common in late adolescence. Among boys, destruction of property and injury to person are very common, while girls' delinquency more often takes the form of petty stealing of ornaments and clothes, lies, and deceptions. In Fig. 52 are shown the most common offenses of boys and girls in 143 juvenile courts during the year 1931.

Delinquency reaches a high frequency in adolescence. This is due more to social causes than to physical or emotional ones, as is commonly believed. Thievery, for example, comes from the difficulties the adolescent has in getting a job and the very low wages paid, while sex delin-

quency comes from delayed marriage resulting from economic necessity, a condition rarely ever found among primitive peoples where early marriage is economically possible. Because the adolescent must, for the first time in his life, make social adjustments without the aid of parent or teacher, he may fail if his early training has not prepared him for this. As L. S. Hollingworth (1928) has described it: "The majority of criminals lose their way socially while they are still in adolescence" (p. 194).

CHAPTER XIII

DEVELOPMENT OF RELIGIOUS INTERESTS

Meaning of Religion.—Religion is, according to Webster's dictionary, "the outward act or form by which men indicate recognition of a god or gods to whom obedience and honor are due." It involves a desire for help, security, and consolation not given by the world, a dependence on a power outside of oneself, a feeling of confidence in the power appealed to, and an emotional reaction of a reverential sort. *Religion includes two elements, belief and practice.* Both of these are important not only in childhood but also in adolescence. At different ages, however, the relative importance of the two is not the same.

Religion is a product of the child's environment and is developed partly by the example set by parents, as in the case of churchgoing and grace at meals, and partly by direct, formal religious instruction in the home, Sunday school, or church. Of the two elements of religion, belief and practice, major emphasis is placed on the latter. To the little child, religion is ritual. He learns to pray at home and later learns the ritual of the faith of his parents through Sunday-school or church attendance.

Religious Training.—Among primitive peoples, religious training is included in the public ceremonies of the tribes. They recognize adolescence as the age for religious instruction, and they expect the adolescent to accept the religion of the tribe at that time. This implies that they regard religion as too complex for children and thus defer instruction along religious lines until the child is old enough to comprehend its meaning. The age of religious comprehension is, for them, the age of puberty.

This attitude contrasts markedly with Christian and many other religions which start religious instruction as soon as the child can comprehend words. This is generally given as preparation for admission to the church and is so theological that it is usually far beyond the ability of the little child to understand.

Because so many adolescent boys and girls become skeptics and agnostics, many parents try to forestall this by rigid religious training in childhood, on the theory that, if religious concepts are fully established before the age of skepticism, it will eliminate the trouble that comes when doubts arise. This, however, is usually not the case. The more rigid and dogmatic the training in childhood, the more apt the adolescent is to doubt the religious concepts he had formerly accepted in an unquestioning fashion.

Religious beliefs are, for the most part, meaningless to the child. Through religious teachings, he absorbs ideas, phrases, and theories which are far beyond his comprehension, because they are vague and abstract instead of definite and concrete. Even the language of religion is different from everyday speech, and this adds to the difficulties of comprehension. Most religious beliefs are taught in a dogmatic fashion and are so remote from the child's everyday life that they lack the interest and glamour of fairy tales. The result is that they do not appeal to the child as much as religious ritual.

Because the child is not a miniature adult in mental make-up, a religion that is suited to an adult is no more suited to a child than are adult stories. If religion is to mean anything to a child, it should not only be concrete in form and presented in language that the child uses constantly, and thus can understand, but it should also be presented in a less dogmatic fashion than is usually the case. The child wants to satisfy his curiosity by asking questions. Religious instruction should provide for this if it is to fulfill its purpose.

METHODS OF STUDYING RELIGIOUS ATTITUDES

The study of the religious development of the child is difficult because its important phases come during adolescence when the individual is reticent about discussing personal feelings and emotions. Studies of diaries, letters, and poems written by adolescent boys and girls reveal information about changes in religious beliefs and emotional attitudes which could not be obtained by a more direct method. Answers to questionnaires give information, though often it is expressed too cautiously to reveal true attitudes. Direct observations of boys and girls at different ages also reveal much information of importance.

Kupky (1928) investigated the religious ideas of the adolescent by having fifteen- and sixteen-year-old girls write themes on the subject, *What arouses my reverence*. He also obtained material for his study from the poems, letters, and diaries of adolescents. Barnes (1893) and Leuba (1916) based their studies of religious attitudes on material obtained from compositions written about religion.

Chassell (1921) formulated a test of religious concepts to determine the child's attitude toward religious subjects. In the *Parable interpretation test*, for instance, the parable is read to the child, and the child is asked to check which of four given explanations of what the parable teaches is correct. For example:

"The kingdom of heaven is like unto a grain of mustard seed, which a man took, and sowed in his field; which indeed is less than all seeds; but when it is grown, it is greater than the herbs, and becometh a tree, so that the birds of the heaven come and lodge in the branches thereof."

The four lessons that might be drawn from this parable are:

1. The Kingdom of heaven is insignificant.
2. The Kingdom of heaven is easily destroyed.
3. The Kingdom of heaven makes great growth from a small beginning.
4. Birds of the air like mustard.

Along the same lines, Chassell and Chassell (1922) constructed a *Test of religious ideas*. Questions were asked and a number of answers given. The child was asked to select the ones that give the best answers, as:

How do you think of God?

Read the words in the following list, and choose the five that best express your thought of God. Mark your first choice 1, your second choice 2, your third choice 3, and so on, until you have marked five in all. If you think of better words, add them on the dotted lines at the end of the list, and include them when marking.

Ruler	Detective
Judge	Giant
Our Maker	Protector
Spirit	Policeman
Father	Creator
Tyrant	Helper
Love	Universal mind
Man	Christ
Force	Good will
Angel	.....
Perfect being	.....

Throughout the chapter there will be, from time to time, discussion of the methods used by different investigators.

EARLY RELIGIOUS ATTITUDES

Like other phases of development, religion follows a pattern that is more or less the same for all individuals, regardless of the faith to which they belong. Their attitudes and reactions are fundamentally the same, even though the doctrines and rituals they have been taught differ markedly. For that reason, it is possible to trace the normal religious development in children.

Curiosity about Religious Subjects.—The young child is curious about the universe as well as about the everyday world in which he lives. He thinks of them as being on an equal basis, and there is no metaphysical meaning associated with them. Between the ages of three and four years, the child's questions often relate to religion. "Who is God?" "Where is heaven?" "How do you get there?" Mysteries centered around birth, death, growth, and the elements are explained in religious terms.

The child accepts almost any answers given to his questions, and these satisfy him temporarily. But, in many cases, they are not adequate later

and often lead to doubt and skepticism during the adolescent years. Similarly, stories of heaven, hell, angels, devils, and miracles are accepted on faith. What he believes depends upon what he has been taught at home or in Sunday school. MacLean's (1930) study of children's ideas of God in Protestant religious faiths showed lack of discriminative thought on the children's part. Their ideas were often flatly contradictory, as shown, for instance, by the fact that they believed God to be a wonderful person, but also that he would strike a man dead with a stroke of lightning for profanity. The ideas they held proved to be strikingly similar to those found in Sunday-school literature.

While most young children accept religious teachings on faith, and believe implicitly whatever they are taught, whether it be in answer to their questions or merely as a part of the routine religious instruction at home or in Sunday school, there are times when almost every child expresses doubt. This, Starbuck (1897) found, was apt to occur when the children's prayers were not answered. Religious doubt is more frequently experienced by very bright children than by those whose intellectual development is of a lower order. When the young child does question his religious teaching, his reactions are unemotional and objective. When the episode that gave rise to the doubt is passed, his doubt likewise passes and is quickly forgotten.

Religious Concepts.—The religion of the young child is realistic. He thinks of God, angels, the devil, heaven, and hell in terms of the pictures he has seen of them. This was shown a number of years ago by Barnes (1893), who asked more than 1,000 children to write compositions embodying their ideas of God, heaven, and hell. He found that nearly all of the children under fifteen years of age thought of them in concrete terms. God was represented as a great and good man. He was thought of as old, with a long white beard and flowing white garments. Some had an image of Him as having a crown and wings. Others thought of Him as being very large. Most of the children believed He was ever-present and could see everywhere. Their descriptions showed that they had a definite idea of God's appearance, but the meaning of God was too complex for them to grasp.

How pictures of people and scenes foreign to the child's everyday experience can distort young children's religious concepts has been well illustrated by Murphy's (1937) statement that children are apt to learn of Jesus, "not as an ideal grown-up who helped people, but as a little baby whose mother put him in a straw thing in a barn instead of a crib, and to whom queer-looking men in striped gowns brought presents no baby could use. They learn, too, that there was a bad king, with a ferocious face, of whom the baby's mother was afraid, so that she had to take him a long way from home, riding on an animal that is not seen in the city, nor

even in the zoo" (p. 34). Distortions of religious concepts, due to misunderstanding of the words used to describe or explain them, are common in the case of young children. Jersild (1940) gives, as an example of this, the case of a young child who told his mother about Jesus' twelve bicycles (disciples) and who was puzzled about the "consecrated cross-eyed bear" (consecrated cross, I'd bear) (p. 416).

Because the child tends to regard everything in his environment as *animate*, he interprets religion in that way. He believes that everything is alive and he endows the sun, moon, stars, and all the elements with the same life qualities that human beings have. God, to him, is a man, like any man in his acquaintance. He interprets what he is taught in terms he can understand. By the age of six or seven years, he reserves his animistic beliefs for objects that move, such as the sun and moon.

Betts (1929) asked 480 ministers and 240 students of five denominations about the religious instruction they would give to children. He found that 33 per cent of the ministers and 25 per cent of the students said they would teach that God is angry when we do wrong. Of the group, 16 per cent of the ministers and 6 per cent of the students said they would teach that God sends storms, earthquakes, and sickness to punish people for sins. With teaching of this type, it is not surprising that the child develops the definite and concrete concepts that he does.

Children's Prayers.—Almost as soon as a little child can pronounce words, the average parent believes it is time for him to learn to say his prayers at night before going to sleep. Most children accept the idea of praying as a part of the routine of going to bed and only occasionally take an irreverent attitude toward it. If the child is taught to end his prayer with the plea, "God bless Mommy, God bless Daddy," and this is repeated for all his friends and relatives, the prayer has somewhat more of a personal meaning for him than it otherwise would have, though the meaning of the word "bless" is unknown to the child.

Religious Attitudes.—The young child is *reverent* in his attitude toward religion. To him, the pageantry of the religious service and the beauty of the church decorations are awe-inspiring. When taught to regard these in a reverent manner, he does so and thus derives a feeling of security from them.

Typically, the religion of little children is *egocentric* and self-seeking. To them, prayers and worship are means of attaining some childish desire and their attitude is primarily one of being good because of the reward to be obtained. This attitude is in keeping with the child's personality. Just as he is accustomed to having things done for him by other adults, so he visualizes God as a person who will do things for him. To the young child, for example, Christmas is a time to receive toys and gifts, and not the time when giving to others means much to him.

Religion at this age is *formal*. This is due to the fact that in the early religious training of the child emphasis is generally placed on the verbal aspects of religion. The child learns to recite stereotyped phrases, as "God is Love," and to say his prayers even though he does not know what they mean. Even the words he learns to recite are different from those used in everyday speech, with the result that the meaning of the thought is lost to him. Any attempt to simplify this merely adds to the child's confusion.

RELIGION IN LATE CHILDHOOD

Religious Concepts.—The religious attitude of the older child is in many respects similar to that of the young child. Religious concepts, which have been developed as a result of religious instruction, are more often vague than wrong. A good illustration of how *confusing* religious concepts may be to the child is shown by an example given by Watson (1924). A primary teacher who was teaching the Lord's Prayer to a group of mission children said, "This is such a beautiful prayer. I love the way it starts, 'Our Father.' We have fathers, haven't we?" "Yes," answered one peaked, little girl. "My father slaps my mother and pulls her hair, and swears at us somethin' awful." Because the child builds up concepts about unknown people, places, and situations in terms of those he knows, it is not surprising that his concepts about the unknown as taught him in his religious instruction become confused with already developed concepts.

One of the earliest investigations of religious concepts was made by G. Stanley Hall (1891) in his study *The contents of children's minds on entering school*. Answers given to questions revealed definite and clear-cut concepts of God, heaven, and hell. The following reply to a question about heaven is typical of the way children of this age think of heaven: "When children get there, they have candy, rocking horses, guns, and everything in the toy shop or picture book, play marbles, tops, ball, cards, hookey, hear brass bands, have nice clothes, gold watches, and pets, ice-cream and soda water, and no school."

Many different concepts of God were reported by Case (1921). Some of the youth thought of Him as the Great Magician, some as the Great Provider, some as the Great Detective, some as the Despot, and some as a loving Father, helping them and others. Mudge (1923) reports that of several hundred boys and girls of the ages six to fourteen years, 77 per cent stated that they had a clear visual image of God. On questioning 170 college undergraduates, 139 recalled a distinctly visual and antropomorphic image of God in late childhood. In all but 22 of these cases, the images were attributed to pictures seen in childhood and to the teaching

of older people. Those who recalled a distinct image of God's face recalled it as follows:

Kindly.....	55
Stern.....	17
Sometimes kindly and sometimes stern.....	14

A study of boys and girls of all denominations brought out the fact that religious concepts are similar in all of them, according to Leuba (1916). Descriptions of God's appearance were of the conventional type, as an old man with long white hair and beard, white robes, and a kindly face. More than 75 per cent of the youth studied placed God's abode in heaven. God's activities consist of being creator, controller of natural phenomena, and provider of food and clothing.

Religious Doubt.—At this age, the child is often confused about denominational differences in religion and questions which doctrines are right. Likewise, he may become critical of some of the religious concepts he learned when he was a little child. Case (1921) found that the inadequacies and inconsistencies in the teachings about God are often recognized by the older child and thus lead to questioning or attempts at reconciliation on their part. Very often, however, the critical attitude is assumed because the child enjoys asking questions to put the Sunday-school teacher "on the spot." What thus appears to be religious doubt is in reality little more than a form of smartness.

How superficial the critical attitude of the child is, may be seen by the fact that he is not worried or distressed because he cannot or will not accept in an uncritical fashion what is taught him. He forgets the whole matter after Sunday school is over. This contrasts markedly with the adolescent, who ponders over the matter and becomes emotionally disturbed when religious concepts conflict with scientific or pseudo-scientific ones.

Religious Services.—Religious services in Sunday school or church may appeal to the older child because of their colorful pageantry. He usually likes to sing, and the ritual of the church service intrigues him. He enjoys looking around at people at worship to see what they are doing. His attitude is a strange mixture of awed reverence and curiosity. When the novelty of the service wears off, the child begins to rebel against church attendance. He enjoys going to Sunday school only so long as his friends go too. He likes young people's organizations, such as gymnasiums in the cities and "sociables" in small communities, picnics, holiday celebrations, and outings. His interest is thus primarily social rather than religious.

At this point, a rather small percentage of boys and girls *attends* Sunday school and an even smaller percentage goes to church. Because the number varies from one community to another, it is impossible to give

definite statistics. As a general principle, however, the percentage becomes smaller as the community becomes larger. That is, in large cities a smaller percentage of children attend religious services than one finds in small towns or country villages.

The explanation for this is that parents as a rule do not attend religious services, except on special occasions at holiday time, and consequently their sons and daughters rebel against going, unless their friends attend. In small communities, more adults go to church because it is the customary thing to do, and they in turn insist that their children go also. In a study of children of different degrees of intelligence, Lehman and Witty (1928) found that dull pupils showed more interest in religious activities, such as playing Sunday school, than bright ones. They also spent more time going to Sunday school and church.

Religious Attitudes.—The religion of the older child, like that of the young child, is *egocentric*. This is well illustrated in the study made by Freeman (1931) of first-grade pupils' concepts of Christmas. They believed Christmas to be an occasion to appease their acquisitive tendencies to a pitch of greediness. As Freeman pointed out, all were "strong on getting," with very little thought of "giving." Typical reactions were as follows: "Last Christmas I got a tricycle and the next year I got a mamma doll." "I like Christmas because Santa has brought me a wagon and a new brown suit."

Little sentiment or emotionality accompanies religion at this age because religion is an impersonal experience. Sermons to make their appeal to youth must be *concrete*. The stories and illustrations must be specific in application. Religion, to the child, is a means of self-improvement, of avoiding sin and its consequences. His attitude is not affected by an emotional element which colors the attitude of the adolescent or adult. Even the thought of sin or punishment is impersonal and unemotional.

Prayer.—By the older child, prayer is regarded primarily as a means to an end. The major emphasis is on asking for favors, which will satisfy the one who asks for them. At no time does the prayer of the child have a mystical association. MacLean's (1930) study of Sunday-school children showed that a large proportion of the children regarded prayer as "talking to God," in which the child emphasized help in doing right and avoiding wrong, help in getting what he wanted, rather than requests for concrete gifts. Ninety-five per cent of the children agreed with the statement, "When I talk to God, I often find out what is right for me to do"; 90 per cent, with the statement, "God answers prayers mostly when we do our best to answer them ourselves"; and only 6 per cent with the statement, "It doesn't do a fellow any good to pray."

Religious Stories.—The stories in the Bible have marked appeal for the older child in much the same way as fairy stories do. They relate to

people, countries, and situations so different from those of the child's everyday environment that he enjoys hearing certain of the Bible stories time after time, just as he enjoys a repetition of his favorite fairy stories. Interest in persons is always greater than interest in doctrines, though at different ages, children show preferences for different parts of the Bible. Dawson (1900), in a study made in 1900, noted that up to eight or nine years of age, children's preferences were for stories relating to the birth and childhood of Jesus and the childhood of such characters as Samuel, Moses, Joseph, and David, while from nine to fourteen years, the historical books of the Old Testament had the greatest appeal.

ADOLESCENT RELIGIOUS ATTITUDES

G. Stanley Hall's books on *Adolescence* and the publication of statistics on conversion at the turn of the twentieth century have led to the widespread belief that adolescence is characterized by a marked awakening of religious interest. This has generally been interpreted as an outgrowth of the physiological changes accompanying sexual maturity. Later investigations have brought out that, while there is, without question, a change in religious attitudes, as well as an increase in religious interest, this change is not due to biological but rather to social causes.

Social Factors.—At the beginning of adolescence, there is generally a carry-over of the religious attitudes that characterized late childhood. As time goes on and the adolescent's social environment becomes broader and more diversified, changes are very apt to occur in the religious attitudes of both boys and girls. Whether the change will result in a marked increase in religious interests, or doubt and skepticism, depends to a large extent upon what social forces are present. It is not at all uncommon for the adolescent to show a deep and sincere interest in religion at first, then later swing to the opposite extreme and question all his former religious teachings. Marked interest in religion, followed by doubt, is very characteristic of the adolescent who goes to college after completing his high-school course.

To test the religious beliefs of college freshmen, Dudycha (1930a) gave all incoming freshmen at Ripon College a printed sheet with 25 religious propositions to check. This was done before college instruction began. In the table at the top of page 351 are shown the beliefs and the percentage of students who claimed to believe each.

From these results, Dudycha concluded that students entering college are much more inclined to believe conventional religious beliefs learned in childhood than to disbelieve and that they are, for the most part, not lukewarm in their beliefs.

Similar results were obtained by Dimock (1936) in a study of boys from the time they were twelve years old until they were sixteen. He

TABLE XLIII.—LIST OF RELIGIOUS PROPOSITIONS AND PERCENTAGE OF INDIVIDUALS WHO BELIEVED EACH

Expositions	Percentages
Ten Commandments should be obeyed.....	98
Divinity of Jesus Christ.....	93
Forgiveness of sin.....	86
Genuineness of Christ's miracles.....	84
Virgin birth of Christ.....	82
Holy Spirit.....	75
A day of final judgment.....	65
Resurrection of the body.....	64
Immortality.....	63
Existence of angels.....	49
Existence of the devil.....	47
World was created in six solar days.....	47

Source: DUDYCHA, C. J. The religious beliefs of college freshmen. *Sch. & Soc.*, 1930, 31, condensed from table on p. 207.

used a test of religious ideas, including 60 items relating to ideas of God, Jesus, prayer, and life purpose, as illustrated below:

Do you think God is in heaven, sitting on a golden throne?	Yes	No
Does Jesus mean just the same as God?	Yes	No.
Can a person who does not believe in God lead a good life?	Yes	No

He found no change in religious thinking in the case of the boys studied, even though the majority were postpubescent at the end of the study. He therefore concluded that changes in religious thinking come from environmental and social conditions and not from growth.

Reverence.—Not until adolescence does religion become subjective and personal. At that time, religious experiences are understood in a way that would not have been possible at an earlier age. With this change in attitude comes a reverence not experienced before. This increases the adolescent's interest in religion and changes his whole point of view about it. Kupky (1928) asked girls fifteen to seventeen years old, when they first experienced a feeling of reverence. Nearly half of them said they first experienced a feeling of reverence when they suddenly realized the beauty and wonder of nature; slightly more than 20 per cent said their first feeling of reverence came in connection with some religious observance; while the rest said they had never experienced reverence.

Influence of Early Training.—The effect of early religious training on the religious attitudes of the adolescent is different in the case of religious beliefs and religious activities. As a general rule, one finds the adolescent continuing to carry out religious *activities* learned in childhood, such as prayer and church attendance, while at the same time discarding religious

beliefs that were likewise learned in childhood. If the child has been forced to accept religious beliefs in an unquestioning manner, he is more apt to discard them during adolescence than is the individual who had a more liberal religious education and whose beliefs were accepted willingly.

Shuttleworth (1927) investigated the effect of early religious training in the home on college sophomore men by means of a self-rating test. He found that strong religious home training carried over very little into the religious beliefs of the sophomores, as shown by a correlation of .208, while the effect on religious activities was greater, as shown by a correlation of .436. Leuba (1916) reported that 32 per cent of the men and 17 per cent of the women students studied by him believed that the existence or non-existence of God would make no difference in their lives; while only 25 per cent of the freshmen at Syracuse and 14.7 per cent of the seniors studied by Katz and Allport (1931) believed in a personal creator.

Participation in religious organizations occurs in a large percentage of adolescent students. Strang (1929) reported that 63 per cent of the high-school students she studied attended either Sunday school or church; at Northwestern University, Betts (1929) found that 75 per cent of a group of nearly 2,000 students were church members, of which group, 33 per cent attended church regularly; and at Syracuse, Katz and Allport (1931) discovered that 39 per cent of a group of 1,321 students attended church once a week and prayers once a day. Nelson's (1940) study of students from denominational colleges and state universities showed that students from denominational colleges were more religious than those from state universities; girls were more religious than boys; and freshmen took a more favorable attitude toward Sunday observance and church attendance than did the seniors of the group.

Evidence of Changed Attitudes.—Even though there is a more marked change in the religious attitude of some adolescents than in others, one may generally find four distinct evidences of this change when the adolescent attitude toward religion is compared with that of the child. (1) There is a decline in *Sunday-school attendance* from the age of fourteen or fifteen years on. (2) There is a decline in interest in *church* and religious activities. (3) There is a change in *religious attitudes*. This change may take the form of heightened interest or it may be marked by a skeptical, critical attitude. (4) There is a change in religious *concepts*. Starbuck (1897), for example, in questioning 390 high-school students, found that 72 per cent of them believed it possible to "see God."

RELIGIOUS AWAKENING

Religious awakening consists of the reconstruction of religious attitudes and beliefs, accompanied by an increased interest in religion. No individual should carry childish beliefs about religion into maturity

because they will not prove to be satisfactory to him as he grows older. Beliefs, simplified to the point where a child can comprehend them, must now be elaborated and changed to meet the more mature intelligence of the adolescent. In addition to that, beliefs that have been vague and confused become clarified at this time. This results in a "clearing of the religious atmosphere."

Through the use of a free-association test, Bose (1929) studied the clarification of religious concepts in the case of boys and girls, eight to eighteen years old, in church schools. He found a vagueness and confusion of meanings in the concepts relating to spiritual experiences, as "conversion," "Christian," and "Saviour," while concepts relating to special religious days or places, as "Christmas," "Sunday," and "church," were clear and definite. Pronounced development in the meaning of religious concepts came from the ages of eight to fifteen years, but little development appeared after the age of fifteen.

The three outstanding elements of religious awakening, apparent at the beginning of adolescence, Starbuck (1897) found to be: (1) insight, involving a rational comprehension of the importance of religion; (2) a moral development involving perception of right and wrong; and (3) an emotional response. In the table below are given the percentages of each.

TABLE XLIV.—RELIGIOUS CLARIFICATION PRECEDING ADOLESCENCE

Clarification showing itself as	Females		Males	
	Percentage of cases	Average age	Percentage of cases	Average age
Insight.....	10	12.9	7	(12)
Moral.....	17	10.6	11	14.1
Emotional.....	21	10.6	5	(12.2)
Unclassified.....	3	(9.1)	9	13.7
Sum of above.....	51	10.9	32	13.2

Source: STARBUCK, E. D. Contributions to the psychology of religion. *Amer. J. Psychol.*, 1897, 9, 75.

Causes of Religious Awakening.—The awakening of interest in religion and the clarification of ideas about religion, which occur during the early years of adolescence, are brought about by a number of causes. Increased *intelligence* and ability to reason motivate the adolescent to ponder over childhood beliefs. This, added to increased *knowledge* coming from scientific and literary studies, interpreted according to the personal views of high-school teachers or college professors, causes the young adolescent to reexamine and change many of his religious beliefs that he has carried over from childhood in a hitherto unquestioned manner.

It is popularly believed that colleges wean students away from traditional religious beliefs, and courses in science are most often accused of destroying the individual's beliefs in religion. As a matter of fact, what they do in many instances is to cause the adolescent to examine his religious beliefs in a critical fashion and help him to construct a new point of view better suited to his more mature intelligence and knowledge.

To discover what influence college courses have on religious beliefs of students, Griffin (1929) asked seniors at Reed College what changes had occurred as a result of their training in college. He found that many of the students had entered college with half-thought-out religious beliefs which they had accepted in an unquestioning manner from parents or teachers. Beliefs of a supernaturalistic sort were found to disappear when students in both high school and college were stimulated to think about them. The more abstract the attitude, on the other hand, the less likely it was to be changed by college teaching.

Freedom to *discuss* religion without restraint, in "bull sessions" and on occasions when high-school or college students meet away from adult supervision, also acts as an important factor in the religious awakening of adolescence. From these discussions, the individual not only gets a changed point of view about religion but he also develops a greater and more alert interest in religion than he ever had before. Betts (1929), in a study of students at Northwestern University, reported that 69 per cent of the students discussed religion with their fellow students and 15 per cent with their teachers.

Finally, because the adolescent has to meet *problems* for the first time which *he himself must solve*, his interest in religion is increased, and he regards it as a refuge from the distress of this life. Problems of a personal sort, relating to friendships, romances, or plans for the future, are apt to baffle the young adolescent to the point that he seeks a way out through the aid of religious expression. To him, religion now has a personal appeal, as contrasted with the vague, objective, impersonal attitude that he formerly had in regard to it. Studies of the diaries of boys and girls in the early adolescent years have shown this fact very clearly.

Religious Awakening and Emotional Upsets.—Religious awakening in early adolescence, accompanied by increased interest in religion and reconstruction of religious beliefs is normal and wholesome. But it is apt to be accompanied by an emotional strain of greater or less intensity, for discarding or revising of childish beliefs, which the individual has been taught to regard as sacred, is apt to be upsetting and to lead to doubts and worries. If it were not for the emotional accompaniment of the religious awakening, it would not attract the attention that it does; it would be regarded as an experience of no greater consequence in the individual's

life than the discarding of other childish beliefs in favor of more mature ones.

RELIGIOUS CONVERSION

Religious conversion means that religion becomes personal to the individual and is regarded by him as playing an important role in his life. As has been pointed out above, among primitives, as well as among civilized peoples, early adolescence is the age of religious conversion. In the initiation ceremonies of primitive tribes, religious training is given as part of the preparation for adulthood. Similarly, most religions among civilized peoples prepare the adolescent for confirmation, or entrance into the church, at this age.

Because early adolescence is the age when there is need for an emotional outlet, religion offers this outlet in an intense and approved manner not attainable to the same degree in any other social organization. A feeling of insecurity, anxiety about the future, fear of death, confusion about life in general, and similar questions, which never before troubled the child to any great extent, now begin to prey on the mind of the adolescent. Similarly, emotional conflicts, arising from love affairs that end unhappily, cause the adolescent to seek an emotional outlet. The adolescent then may turn to religion as an escape from reality. Brooding, morbid introspection, reading the Bible, and prayer all pave the way for religious conversion. As L. S. Hollingworth (1928) has pointed out, every adolescent who has the mental capacity of a twelve-year-old has a need for some form of settled belief about the world in which he lives.

Effect on Behavior.—Religious conversion is not limited to the acceptance of religious beliefs. The adolescent seeks emotional outlet in church services, especially those with pronounced ritual, in evangelical meetings, in prayer, in writing poetry, in social-service work, and in attempts to reform and convert others whose behavior suggests that they, too, are on the path leading to eternal damnation. It is not uncommon for the adolescent to decide at this age to devote his life to service for others, through missionary, social-service, or church work of one type or another. While both boys and girls are susceptible to religious appeals at this age, girls are more so than boys.

The adolescent wants to make self-sacrifices as an atonement for what he believes to be his sins. The religion that offers opportunities for this has a great appeal for the adolescent. In the Catholic faith, it is not uncommon for boys and girls to decide to join monasteries or nunneries, and in other religions, to plan to devote their lives to foreign-missionary work. Since this desire for self-sacrifice is apt to be only a passing phase in the adolescent's life, most churches wisely refuse to allow the adolescent to make a final decision about his future until he has had ample time to

consider it seriously, free from emotional stress and strain. To meet the temporary need for an outlet for the desire to make self-sacrifices, many churches and religious organizations offer the adolescent chances for social-service work among the poor.

In a retrospective study of religious attitudes, Starbuck (1897) discovered some important points about religious conversion from a study of the answers given on questionnaires by men and women. After joining the church or being confirmed, there is generally an increased interest in religion, accompanied by a tendency to engage actively in religious work. Storm and stress, ferment of feeling, distress, and anxiety are common accompaniments of religious conversion. They are more intense in girls than in boys and also occur earlier and last longer. In the table below, Starbuck has shown the relative prominence of the ways in which storm and stress are manifested.

TABLE XLV.—SHOWING THE RELATIVE PROMINENCE OF THE WAYS IN WHICH STORM AND STRESS MANIFESTS ITSELF

Storm and stress shown as—	Females		Males	
	Percentage	Average age	Percentage	Average age
Feeling of incompleteness and imperfection.....	25	14.3	11	15.4
Sense of sin, remorse, etc.....	15	13	13	14
Friction against surroundings.....	9	15.6	16	13.8
Asceticism.....	5	....	3	....
Brooding, morbid conscience, etc....	31	13.6	6	15.6
Fear of death or hell.....	7	11.7	....	....
Connected with beliefs.....	8	16	31	20.7
Connected with control of passion....	..	....	8	14.3

Source: STARBUCK, E. D. Contributions to the psychology of religion. *Amer. J. Psychol.*, 1897, 9, 86.

Heightened religious activity Starbuck found to occur in 26 per cent of the girls and 20 per cent of the boys studied. The age at which this occurred coincided directly with the period of emotional stress and strain accompanying conversion. Two peaks in the ages of conversion were noted by Starbuck. In the case of girls, the peaks occurred at thirteen and sixteen years, while in the case of boys, they came two years later, at fifteen and eighteen years. The peaks at the later ages were much less pronounced than at the earlier ages. In the case of both boys and girls, the age of conversion corresponds to the average age of puberty.

Types of Conversion.—Conklin (1935) has listed three types of conversion. They are:

1. *The crisis type*, in which conversion comes in a religious crisis, accompanied by intense emotionality and followed by quiet joy and an attitude of helpfulness toward mankind. This type occurs relatively infrequently now and is seen mostly in religious revivals.

2. *The decision type*, in which the individual is converted at a special ceremony, as joining the church, baptism, or first communion. The age at which this type of conversion occurs differs in different religions. In America today, conversions of this sort are expected and approved by most religious denominations.

3. *The gradual type* of religious adjustment, which comes about slowly and without any definite religious experience. This is generally regarded as the most desirable of the three, as it is free from the strong emotional accompaniment found in the ease of the two former types.

RELIGIOUS DOUBTS

The intellectual element predominates in the religious experiences of late adolescence just as the emotional element predominated in early adolescence. This gives rise to an attitude of skepticism and doubt, often of so pronounced an intensity that the religious beliefs, firmly held to a year or so before, are now critically analyzed and often discarded. The more dogmatic and doctrinal the early religious training has been, the more apt the adolescent is to doubt it. The severity of the doubt will vary from one adolescent to another, ranging from a passing interest to a skepticism so intense that the adolescent feels that all the props on which his life philosophy have been founded suddenly give way beneath him.

Causes.—There are a number of causes of adolescent doubt. Perhaps the most important of all causes is the attitude of *independent thinking* which has been established as a result of school and college training. Emphasis is placed on thoughtful analysis and logical reasoning, even to the extent of encouraging the students to question the teachings of their professors and textbooks. It is not surprising, then, to discover that this attitude carries over to religious doctrines. Added to this cause is the disturbing influence that comes from the *study of science*. Many facts, taught and proved in science courses, seem to be in direct contradiction to early, literal training in religion.

This would seem to show the faultiness and inadequacies of the teaching of religion, not of science. It indicates that religious training, for the most part, has an inadequate foundation, so that it cannot withstand the effects of critical analysis and scientific diagnosis. The more dogmatic and theoretical the early religious training, the more pronounced will be the overthrow of its dogmas as a result of critical analysis. And, in turn, the greater will be the attitude of doubt and skepticism on the part of the adolescent who, during childhood, was taught these beliefs.

Reading of scientific, historical, or philosophical books, *discussions* with friends, classmates, and teachers, or *general observations* on life, add to the adolescent's attitude of doubt. Whenever discussions take place

in a group of adolescents brought up in different faiths, there is sure to be a conflict of opinion, and the faith of each is shaken to a certain extent by facts revealed by the others. Discussions with high-school or college teachers, many of whom approach religion in a more critical and analytical fashion than parents do, adds to the adolescent's attitude of doubt. The more popular the teacher is, the greater weight his or her opinion will have. Likewise, general observations on life, backed up by scientific study, lead the adolescent to criticize some of the religious teachings he formerly accepted. The creation of the world in six days and the Virgin birth are typical examples of this.

Starbuck (1897) has listed the following common causes of religious doubt in adolescence, and the relative importance of each:

TABLE XLVI.—SHOWING THE RELATIVE PROMINENCE OF THE OCCASIONS OF RELIGIOUS DOUBT

Occasion of doubt	Female, per cent	Male, per cent
Educational influence.....	23	73
Natural growth.....	47	15
Calamity (death, misfortune, etc.).....	9	9
Misconduct of Christians.....	2	3
Unanswered prayers.....	7	
Ill health.....	12	

Source: STARBUCK, E. D. Contributions to the psychology of religion. *Amer. J. Psychol.*, 1897, 9, 89.

It is apparent from the figures given above that educational influences and "natural growth," which implies the ability to grasp and understand situations which formerly were accepted on faith alone, are responsible for the majority of cases of doubt. It is thus to be expected that the adolescent of high-grade intelligence, who has continued his education into high school and college, would be much more apt to experience religious doubts than the adolescent of mediocre intelligence whose education never went beyond the grade schools.

Effect of College Study.—Dudycha (1930a) gave 852 freshmen of six colleges a series of religious propositions and concepts at the time of their entrance to college, so as to eliminate the influence of college instruction. He (1933) also gave 305 seniors of seven colleges the same series to see if college instruction leads to atheism. His findings are presented in the table on page 359.

The results of his study show that college students believe implicitly or are inclined to believe three times as many of the 25 propositions given as they disbelieve. For example, 93 per cent believe in the existence of God.

While it is true that the freshmen studied had more beliefs than did the seniors, the difference in percentages was not very great.

TABLE XLVII.—LIST OF RELIGIOUS PROPOSITIONS AND DISTRIBUTION OF RESPONSES OF COLLEGE SENIORS INDICATED BY PERCENTAGE

Propositions	A	B	C	D	E
1. Existence of God.....	83	10	03	03	01
2. Ten Commandments should be obeyed.....	76	12	06	02	04
3. Divinity of Jesus Christ.....	73	12	07	03	05
4. Christ died to save sinners.....	69	13	13	01	04
5. Existence of the soul.....	69	14	06	05	06
11. Bible is the word of God.....	58	18	10	03	11
12. Genuineness of Christ's miracles.....	54	19	14	07	06
13. Virgin birth of Christ.....	57	16	13	05	09
14. Holy Spirit.....	54	14	17	07	08
15. Sunday is an holy day.....	54	14	12	06	14
21. Existence of hell.....	23	16	21	10	30
22. Present-day miracles.....	19	14	25	19	23
23. Existence of angels.....	21	15	23	11	30
24. Existence of the devil.....	20	13	19	11	37
25. World was created in six solar days.....	07	08	18	08	59

A means implicitly believe.

B means inclined to believe, but doubt.

C means noncommittal.

D means inclined to disbelieve and doubt.

E means absolutely do not believe.

Source: DUDYCHA, C. J. The religious beliefs of college students. *J. appl. Psychol.*, 1933, 17, condensed from table on p. 596.

Emotional Accompaniment.—In contrast to the child who questioned religious doctrines as a form of smartness, to "put the teacher on the spot," doubting religious doctrines is the source of much mental anguish and emotional distress on the part of the adolescent. This is especially true if he has been brought up dogmatically and has been taught to believe that doubting religious teachings is a sin. Often this occurs at the time when the adolescent is experiencing feelings of insecurity about his work, his future career, or his family relationships, and when his romances are causing him great emotional stress.

Effect on Behavior.—Religious doubts not only may disturb the adolescent emotionally but they also may have a pronounced effect on his behavior. As a result of a period of doubt concerning religion, the adolescent, according to Young (1929), becomes less religious than the child in the following respects:

1. He is less inclined to accept a definite creed involving statement of belief about which he, as an adolescent, feels that no one can be sure.

2. His attitude toward the Bible is changed because of the knowledge that it was composed by a large number of men and modified from time to time throughout the

ages, thus leading to a skeptical attitude about whether it is the written word of God or even inspired by Him.

3. The adolescent devotes less time to contemplation and prayer than he formerly did, and few boys and girls during the late adolescent years are interested in revivals or "experience" meetings.

4. Few adolescents, after experiencing a period of religious doubt, believe in eternal punishment.

5. Few think seriously about the "hereafter."

Individual Differences.—Not all adolescents experience religious doubt to the same extent. Different factors enter into the situation and determine how mild or how severe the doubt will be. The most important factors are education, intelligence, type of community, sex, previous religious training, and type of personality.

Practical Considerations.—Because religious doubt causes mental suffering, and because it almost always leads to the discarding of the religious beliefs and customs established during the childhood years, it is obviously desirable to minimize doubt as much as possible. This can be done if the religious training during childhood is not too dogmatic in form, and if too much emphasis is not placed on how sinful it is to disbelieve or even to question religious doctrines. Encouraging the child to question religious teaching, and attempting to reconcile scientific teaching in the schools with religious teachings at home or in the church, would likewise help to pave the way for the adolescent period of doubt.

When the adolescent begins to question the teachings of the family religion, much can be done to eliminate the mental anguish that accompanies this questioning by focusing attention on an objective study of religions, rather than allowing the subjective, critical attitude toward *one* religion to dominate the adolescent's point of view. Teaching the adolescent the doctrines, rituals, and observances of the different religions of the world today, encouraging him to examine each critically to determine which one fits his personal needs best, and giving him the freedom to choose the one he prefers would do much to encourage a healthy attitude. Few parents, however, will take this point of view. They expect their sons and daughters to accept the family religion, and they treat any questioning of it as sacrilegious.

RELIGIOUS RECONSTRUCTION

Just because an adolescent doubts the religion of his childhood does not mean that he will abandon it. More often than otherwise, he will reconstruct his beliefs, over a period of time, so that eventually he will have a religion, or "philosophy of life," based partly on religious teachings and partly on philosophical doctrines, which fits his needs more satisfactorily than the religion of his family would ever be able to do. This

reconstruction of beliefs cannot be expected to come quickly, and its completion is rarely ever attained until long past the adolescent years.

In Starbuck's (1897) study, based on the introspective reports of men and women, the age of religious readjustment was found to occur mostly from twenty to thirty years of age. In the following table, Starbuck has shown the age and trend of religious experience during the period of reconstruction.

TABLE XLVIII.—SHOWING SOME FACTS IN REGARD TO THE TREND OF RELIGIOUS EXPERIENCE

	Age										Sum Percent- age of cases	
	16-19	20-23 (24)		24-29 (25)		30-39		40 and over				
	Percent- age of cases	Percent- age of cases		Percent- age of cases		Percent- age of cases		Percent- age of cases				
	F	F	M	F	M	F	M	F	M	F	M	
1. Faith reconstructed after doubt and negation.....	1.7	2.5	2.7	4.1	10.7	10.8	12	9.2	13.3	28.3	38.7	
2. In process of reconstruc- tion.....	3.3	3.3	12.0	2.5	4.0	0.8	1.3	0.8	1.3	10.8	18.6	
3. Still negative.....	10.8	0.0	1.3	0.8	2.7	0.8	0.0	0.0	0.0	12.5	4.0	
4. Gradual growth without definite reconstruction..	16.0	9.0	12.0	7.0	6.7	3.0	9.3	6.7	10.7	41.7	38.7	
Unclassified.....	6.0	0.0		0.8		0.0		0.0		6.8		

Source: STARBUCK, E. D. Contributions to the psychology of religion. *Amer. J. Psychol.*, 1897, 9, 103.

From these figures, it is apparent that religious reconstruction comes after adolescence, with an average age of 24 years for women and 24.5 years for men.

Period of Agnosticism.—During the interval of time between the awakening of religious doubt and the readjustment to a religion that is satisfactory to the individual, there is often an absence of religious belief. This is the *period of agnosticism*, in which the individual has no religious faith. How long this will last, and what will cause its termination, is an individual matter. Generally, however, some personal emergency or sorrow shows the individual the need for religion. As a result, he returns to his childhood faith, which now holds a new meaning for him, or he adopts a new faith which he believes will satisfy his own needs better. This new religion may have made its appeal to him because it is held to by

some intimate friend, or it may coincide with his own beliefs as they developed from reading and study.

The religion that is adopted, after a period of doubt has been experienced, is rarely ever accompanied by the emotional intensity characteristic of the religious fervor of early adolescence. Likewise, there is seldom a change in religious beliefs later in life, and the reconstructed religion thus proves to be the lasting religion of adult years. This contrasts markedly with the state of doubt, unrest, and uncertainty that characterizes the religious life of early adolescence.

CHAPTER XIV

SEX DEVELOPMENT

One of the most important phases of the child's development is that of sex, because the whole life of the child, especially adjustment to the opposite sex, is fundamental to happiness and success in mature years. Poor adjustments result in personality disorders and failures in social or business affairs. For that reason, scientific investigation, and proper training and guidance are essential if they are to be eliminated.

Influence of Custom.—No phase of development is so influenced by custom, tradition, and taboo as is that of sex. The subject has received far too little attention of a scientific sort and much too much attention that borders on morbid curiosity. What scientific interest there has been has placed emphasis on the pathological manifestations of sex, with little attention to the development of the sex life of the normal, healthy child.

Among primitive peoples, sex is not a problem during the adolescent years. Because socioeconomic conditions make early marriage possible, many taboos are unnecessary. The result is that in the lower stages of culture, sex development occurs normally and relatively little attention is given to it. Likewise, because there is no restraint to normal development, sex abnormalities are practically unknown.

With advances in civilization, all of this has been changed. Sex life is delayed owing to economic conditions and this in turn often leads to abnormal forms of sex behavior. The seriousness of the situation is intensified by a freedom in mingling with members of the opposite sex, freedom of discussion, movies, and uncensored reading of romantic novels. All of these are of recent development.

The situation is made worse by the attitude of most adults toward the adolescent's love life. Instead of attempting to assist the adolescent to make adjustments which are necessitated by modern civilization, the adult often makes jokes about the adolescent's romances, or he treats them as if they were wrong and thus encourages an attitude of secrecy and shame on the part of the adolescent. The restraints used involve the frightening of the adolescent to control sex expressions. In the case of girls, frightening consists of emphasizing possible pregnancy as a result of contacts with boys, while in the case of boys, emphasis is placed on venereal diseases or "getting the girl into trouble."

METHODS OF STUDYING SEX DEVELOPMENT

Because of the taboos surrounding sex, little scientific research has been carried out to derive accurate information about the sexual development of the child. These taboos are so strong that many individuals hesitate to reveal their own attitudes and experiences, even on an anonymous questionnaire. Shame also, to a certain extent, controls their responses.

Knowledge of sex development has come from material derived from three types of study. (1) *Analysis of the pathological conditions* that accompany sex perversions. This has revealed much information about the stages of sex development of the child, as well as the periods of critical adjustment when normal sex development can become distorted. (2) *Diaries* written during the adolescent years, which give intimate details about the individual's emotional reactions related to sex, as well as the behavior that occurs in relation to romances and exploration of the sex organs. (3) The most fruitful as well as the most reliable source of information is the *questionnaire* form of investigation. Anonymous questionnaires, on which the individual is asked to reveal without any reservations his attitudes, as well as his characteristic behavior in relation to sex matters, give information that could not be obtained from direct observations.

It is true that a certain number of individuals resent questions that seem to pry into their personal affairs, and they either omit answers or falsify them. However, data from a large number of cases helps to counteract this source of error. Like any questionnaire, the sex questionnaire is a method of investigation that is limited in its use to the older ages and cannot be used for subjects much below the freshman year of high school. Many schools and colleges refuse to allow sex questionnaires to be circulated among the students, and this adds greatly to the difficulties of obtaining the desired material.

An example of the questionnaire method used to obtain material about the sex life of college girls is Smith's (1924) anonymous questionnaire. Typical questions asked are the following: "At what age were you first interested in 'going out' with boys?" "Have you ever indulged in 'spooning' or 'petting'?" "How old were you when you first 'spooned'?" "What actuated you in 'spooning'?"

It is obvious that many of the questions like the ones given above are too personal for adolescent girls to want to answer frankly. Moreover, many high schools and colleges would refuse to allow such questionnaires to be circulated among the students because they do not want to focus the students' attention on sex matters or encourage the tendency to discuss sex among themselves.

Criticism of Methods.—The sources of data referred to above lack the control that a good scientific technique requires. They are more of the occasional, circumstantial sort than one would like, but methods using rigid, experimental control are not feasible in the study of this phase of child development. The results of the studies made with these methods will be summarized and interpreted, even though it is impossible to offer specific factual material in the form of diagrams, tables, and figures.

THE PATTERN OF SEX DEVELOPMENT

It was formerly believed that the child was asexual and that sex behavior was dormant until puberty. Any behavior related to sex was regarded as abnormal or as a sign of precocious sexual development. Likewise, any emotional reaction that related to sex was believed to be dormant until puberty. When sex emotions appeared, this was regarded as an indication of the end of childhood and the beginning of maturity.

Freud's Theory.—Freud (1920) first recognized that sexuality appears in childhood. This is well expressed in his statement that, "From the third year on, there is no longer any doubt concerning the presence of a sexual life in the child" (p. 281). He further contended that childhood sexuality is responsible for the type of mature sexuality attained in adult years. Any interference with the normal sex life of the child, he believed, would result in some form of abnormal sex behavior in adult years.

In addition to this, Freud was the first to recognize the fact that the sex development of the individual follows a pattern as definite and predictable in form as the pattern of development of other aspects of the child's life. This pattern, Freud contended, consists of stages toward the goal of mature sexuality.

In the "neutral" period, from birth to three years, the child is concerned with himself and often engages in autoerotic practices, such as sucking his thumb or playing with the genitals. Following this comes the "undifferentiated" stage in which the child is interested in others and makes no distinction between male and female. Attachment to the mother or father now spreads to the playmates. This extends from the third to the sixth year. In the third period, from six to twelve years, the child's affection spreads to teachers and chums of the same sex, with a strongly antagonistic attitude toward members of the opposite sex. Finally, in adolescence, sex interest shifts to the opposite sex, at first in the form of "hero-worship" of older persons, and then to those of the same age. The first love to develop is thus, "mother love," or love for the mother, and the last, "sex love."

Causes of Sex Development.—The sex development of the child not only follows a definite pattern in which different stages clearly appear, but there is a fundamental cause for this, which is glandular. The sex glands

or gonads are responsible primarily for the physiological as well as the psychological aspects of the child's sex development. Education and social standards of conduct influence the form of behavior, which appears as a direct, overt expression of the sex emotions and attitudes. Courtship, for example, takes a prescribed form, dictated by the community in which the individual lives, its customs, traditions, and taboos.

STAGES OF SEX DEVELOPMENT

Data obtained from clinical studies, daily informal observations of children at school, at home, or at play, and retrospective reports, diaries, and other sources, have shown that the child does pass through stages in his sex development which are fairly definite and distinctive, so far as the behavior and attitudes of the child are concerned. While it is true that some children pass through these stages more slowly or rapidly than the average, few skip any one of the stages. In the following pages will be summarized what information there is about each one of the stages and the ages at which they occur in most children.

1. EARLY SEX BEHAVIOR

Before the advent of Freudianism and the psychoanalytic movement, it was believed, as has been pointed out above, that the young child was asexual and that sex is an entirely new development at puberty. It is now known that there is not only sexuality in childhood but that it differs markedly from the sexuality that occurs after the puberty changes have taken place. As contrasted with the definite and focalized sexuality of adolescence, it is of a generalized and diffused sort. Likewise, while sexuality is a dominant factor in the life of the adolescent and has a wide influence on his behavior, in the child it is only of secondary importance and plays a relatively inconspicuous role in his life.

Love Object.—The young baby's first love is for himself. In this *autoerotic* stage, which lasts for the first five or six months of life, the baby shows no attachment for others. The first object of attachment is the *mother, nurse, or person who takes care of the child*. Gradually, during the babyhood years, love attachments are extended to other members of the home environment, whether members of the family or servants. The strongest attachments are for those who make the child's associations especially happy. Even household pets and toys may become the object of the young child's affection. Often, the attachment to a pet or toy and the affection for it are stronger than the love directed toward persons.

When the child begins to play with *other children*, he singles out one or two children and develops a strong emotional attachment for them. At first, the affection is directed toward an older child who, like the adult,

makes the child the center of attention. Because associations of this sort are pleasant to the child, he builds up an affectionate attitude toward his playmate. At the end of the preschool age, as children of the same age learn to play together in an amicable fashion, the child singles out one or two children of his own age for whom he shows real affection. Like his associations with adults for whom he has an affectionate attachment, his contacts with the children he loves are always pleasant.

Preference for One Sex.—Which sex the young child favors will depend to a large extent upon his associations. In the case of adults, the baby and very young child most often favor the female members of the household because their most frequent associations are with them. Later, should the male members of the home prove to be more indulgent, the child may transfer his affection to the father, uncles, or older brothers. Little girls very often show a preference for fathers and brothers, while little boys show a preference for their mothers and sisters. This may be explained by the treatment they receive from the different members of the home group.

In the choice of playmates of their own age, little children play with members of both sexes. Even in the preschool groups, there is a tendency toward unisexual friendships, as was stressed in the chapter on social development. This increases as the child grows older, with the result that, by the time the child reaches kindergarten or first grade, there is a marked tendency for boys to prefer boys, and girls to prefer girls. Girls will include boys in their play more readily than boys will include girls. But, as was pointed out in the chapter on Social Development, more quarrels occur in mixed than in unisexual groups.

Expressions of Affection.—The expressions of affection for the loved one consist of patting, fondling, or kissing, and a desire for close, personal contact. This may take the extreme form of following the loved one wherever she goes and raising stormy protests if this is impossible, as when the mother or nurse leaves the house without taking the child along. Pets and favorite toys are caressed, hugged, kissed, and carried around wherever the young child goes until they literally fall to pieces. If permitted to do so, the child takes a beloved toy to bed and hugs it in his arms, even while asleep.

Shirley (1933) refers to reports by mothers of the earliest signs of affection in the behavior of babies. This is shown by patting the mother's breast while nursing and by cuddling down contentedly when held at the mother's shoulder. During the seventh and eighth months, the mothers reported that the babies showed affection by patting the mother's face, turning their cheeks to be kissed, clasping the mother around the neck, laying their cheeks on the mother's, hugging, and biting. The expressions of affection through patting and hugging, Shirley believed to be spon-

taneous, while the other expressions were taught the babies by their parents.

Expressions of affection in young children are of brief duration. Children may show great fondness for a person while that person is present, but as soon as the individual leaves, he or she is forgotten. It is definitely a case of "out of sight, out of mind." When a beloved member of the family leaves the home, as in the case of death or divorce, or when the nurse leaves the household, the young child never seems to miss the person. He soon transfers his affection to an individual who is present and forgets about the former individual who had dominated his affection.

Campbell's Study.—In a study of the social sex development of the child, Campbell (1939) noted the following characteristics of the sex development of children, five to eight years of age:

1. Children will play with boys or girls and are not embarrassed when found with members of the opposite sex.
2. They are not embarrassed by physical affection from adults or by physical contact with members of the opposite sex.
3. They are not self-conscious about their bodies and they show no signs of modesty.
4. Boys and girls fight one another.
5. Boys show no special courtesy toward women.
6. They do not differentiate play or work as "girl's" or "boy's."

2. PERIOD OF SEX ANTAGONISM

From six to twelve years of age, there is a gradual development of an attitude of antagonism between the sexes. Boys and girls who formerly played together in an amicable fashion begin, during the first or second grade of school, to play more predominantly with individuals of their own sex. And with the growth of interest in play activities of members of their own sex comes the attitudes, on the part of boys, that girls' play is "silly" or "sissified," while girls regard boys' play as "rowdy" or "hoodlum." It is not surprising, then, to find that antagonisms between the two sexes that grew up in relation to play activities develop into a general attitude of antagonism toward the opposite sex.

Furfey (1930) noted that up to the age of approximately eight years, boys mingle freely with girls. Their interests are similar, and they fight and play together without consciousness of sex. At the age of six years, at least 73 per cent of the boys observed by Furfey still played with girls. From the time the boys were eight to eleven years old until they reached puberty, there was a strong distaste for playing with girls, and only 20 per cent of the boys did so. Lehman and Witty (1927c) found that from six to twelve years there is a definite tendency for unisexual play, and games at this age are sex-linked.

Age of Sex Antagonism.—The "age of antagonism" extends from approximately the eighth year to the onset of puberty, which comes, on the average, between the twelfth and the fourteenth year. Instead of decreasing as the child reaches puberty, the antagonistic attitude becomes increasingly more pronounced, resulting in many quarrels between the sexes. This occurs even in the case of brothers and sisters who, as younger children, had been the best of friends. It is a difficult age to cope with in a household where there are both boys and girls, and any attempt to throw the two sexes together in social gatherings is almost certain to meet with failure.

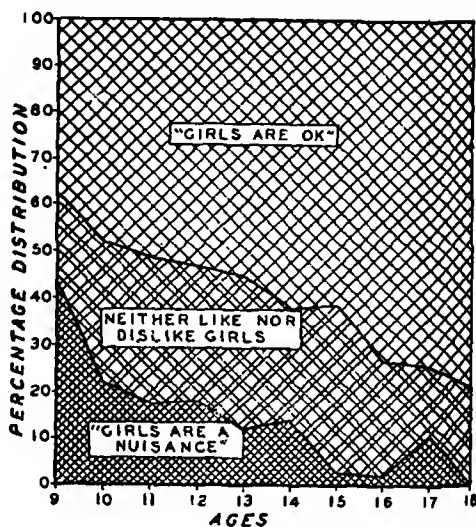


FIG. 53.—Anonymous reactions of seven hundred boys, age nine to eighteen, to a question concerning their attitude toward girls. (Based on unpublished data of R. T. Sollenberger. From F. K. Shuttleworth, *The adolescent period*. *Monogr. Soc. Res. Child Developm.*, 1938, 3, No. 3.)

Cause of Sex Antagonism.—There is, in this antagonism between the two sexes, *no indication of a physiological cause*. Rather, the cause is *social*, and the blame can be placed on the early training in play activities which puts emphasis on different play for the two sexes. An increase in the antagonism comes from the fact that, instead of taking the attitude of "live and let live," boys delight in teasing, tormenting, and interfering with girls' play, while girls, in self-defense, never miss an opportunity to get their revenge by telling tales on boys at home or in school. It is not surprising, then, to discover that, even in the household, quarrels between brothers and sisters are far more common than expressions of affection.

Effect on Behavior.—As a result of this antagonistic behavior, the two sexes spontaneously draw apart. Even in school classes where both

sexes are taught together, boys prefer to sit on one side of the room and girls on the other. During recess, before and after school, the boys group together, as do the girls, and avoid one another as much as possible. Any attempt to bring them together, as in parties, arouses a storm of protest on both sides. Even when brought together in family gatherings, boys and girls of this age are barely civil to one another. Sex antagonism



FIG. 54.—Childhood romance. (From *Parents' Magazine*, April, 1939. Photograph by Leo Aarons. Courtesy of *Parents' Magazine*.)

is so extreme in boys that they do not want anything that resembles a girl. Figure 53 shows graphically the typical attitude of boys towards girls at this age.

Among girls, the antagonistic attitude toward boys is *less pronounced* than in the case of boys. As a matter of fact, it is more nearly an attitude of indifference than of active antagonism in situations in which the girls ignore the boys, instead of tormenting them. They regard boys as

rough, dirty, vulgar, and ill-mannered, and their play as boresome. But, if left alone, they pay no attention to the boys. Likewise, instead of making fun of love in others, as boys do, their attitude is one of indifference.

Campbell (1939) has listed the following characteristic forms of behavior at this age: girls, by the eleventh year, are self-conscious when they touch boys, and boys react in a similar way at twelve years; boys will play games with girls only if other boys are present; boys tease and make derogatory remarks about girls, and also about boys who are interested in girls. Maller (1929), in a study of cooperation and competition in children from two to fourteen years of age, found that work for one's own sex supersedes work for oneself, one's school class, or one's team. This, he contended, shows the strength of unisexual interest.

Childhood Romances.—During childhood, *an occasional romance* between a boy and a girl grows up. There is, in this type of romance, an attitude of affection and respect on the part of the boy, accompanied by a desire to serve the beloved (see Fig. 54). This may consist merely of carrying her books to and from school and protecting her from the teasing and torments of a boys' gang. It differs markedly from adolescent romances in that there is no physical expression of affection, other than perhaps an occasional shy holding of hands. The attitude of the girl toward the boy may be likewise one of deep affection, but there is no desire on her part for physical demonstrations of this affection.

Girls are more tolerant in their attitude toward childhood romances than are boys. They may snicker at and make jokes about the girl who is engaged in such a romance, but they do not exclude her from their group, as the boy is excluded from the boys' gang. In many instances, there is definite evidence that they are envious of the girl who has a boy to accompany her to school, and who receives thoughtful attentions instead of the annoyances that they have been accustomed to receive from other boys.

3. SEX BEHAVIOR IN ADOLESCENCE

With the onset of puberty, sex development progresses at a rapid rate and new forms of behavior, associated with this development, make their appearance. While not all adolescents experience every phase of behavior related to sex development, as it will be described below, most of them pass through this stage by manifesting a majority of them. Variations in the intensity of the emotional accompaniments occur from one adolescent to another, and the specific form of behavior is not always exactly the same, even though the general pattern is similar in its major forms.

Sex development in adolescence is concerned chiefly with the establishment of *heterosexuality*, or the focusing of interest on members of the

opposite sex. It takes four or five years, following the onset of puberty, before the individual develops a healthy, adult level of sexuality which may serve as the foundation for a successful marriage. This will not be achieved by trial and error alone on the part of the adolescent, but it requires guidance on the part of the school and the home. In addition to that, the adolescent must be given opportunities for social contacts with members of the opposite sex in sufficient numbers and of attractive personal qualities, so that he can learn to make adjustments to them. His early adjustments will not prove to be satisfactory, in the long run, any more than the young child's early adjustments to other children are satisfactory. But they serve as the foundation for later adjustments of a more satisfactory type.

The different phases of sex development during adolescence are as follows:

1. Sex Aversion.—The antagonism between the sexes, which originated because of sex differences in play interests, gives way to aversion or an actual hatred for members of the opposite sex. This attitude develops just before puberty and lasts until the puberty development has been completed. It may persist even longer, if social conditions in the home or school have intensified it. When isolation in schools has kept the two sexes separated, each is apt to think of the other in terms of the former attitude of antagonism.

Causes of Sex Aversion.—Sex aversion differs from antagonism in that its cause is primarily physiological, while the earlier attitude of antagonism was brought about by social causes. It develops in connection with the physiological changes that are taking place at that time. Tradition holds that menstruation is a physiological phenomenon of which one should be ashamed, and it is generally referred to as "being sick." This attitude, combined with the secrecy regarding the matter which tradition demands, naturally leads young girls to believe that something shameful has happened to them. Very often, the girl is not informed ahead of time about menstruation, and the fright that she experiences tends to build up an unfavorable attitude which spreads to all experiences related to sex.

Curiosity about sex matters, which has led the young girl to seek information from any source available, causes her to associate the changes taking place in her own body with members of the opposite sex. It is not then surprising to find that aversion to members of the opposite sex arises. As a result, the girl shows shyness in the presence of boys and men and shuns any gathering in which they will be present. It is not at all uncommon for girls who formerly regarded their fathers as the favorite parent to take an antagonistic attitude toward them just because they are men.

Boys experience an attitude of aversion of a similar sort, but much less pronounced than in the case of girls. This is due partly to the fact that they are better prepared for the physiological changes that are taking place in them than are girls; partly to the fact that these changes have never been surrounded by shame or social aversion, as is true in the case of girls; and partly to the fact that boys continue to form their attitude toward the female sex on the basis of their play interests and activities, rather than on the basis of sex behavior.

Besides the physiological causes, there often are *social* causes also. Family upsets in the form of quarrels, divorce, or separation have a pronounced effect on the attitude of aversion toward members of the opposite sex, especially in the case of girls. With the constant reminder of the unhappy aspects of marriage before them, it is not surprising that young girls' dislike for boys and men is increased. Novels or movies that deal with unhappy romances or marriages likewise serve to intensify this attitude. Because boys are at home less than girls, and because they scorn romantic movies and novels, these influences play a relatively unimportant role in determining their attitudes.

Effect on Behavior.—An attitude of sex aversion leads both adolescent boys and girls to avoid members of the opposite sex. Girls frequently distrust all males, even their fathers, and are openly contemptuous of them. This often leads to friction in the household and the severance of a pleasant father-daughter relationship. Both boys and girls, Campbell (1939) found, are sex conscious at this age and will not touch a member of the opposite sex except in a socially approved circumstance, such as dancing. Modesty is very pronounced, and girls especially are very self-conscious about their developing bodies.

Duration.—Fortunately, the period of sex aversion is a phase of *very brief duration*. It generally accompanies the period of physiological changes, which varies in length from 6 months to 1½ years. Should it last longer, it is usually because unfavorable home conditions or other environmental factors have entered into the situation and have thus complicated or prolonged it. Because it is never as intense in boys, on the average, as in girls, it usually is of shorter duration in their case.

2. Crushes.—In the transition from the sex aversion to the romantic love phases of the individual's life, a strong emotional attachment for a member of the same sex is a common experience. At the time when the boy or girl will have nothing to do with a member of the opposite sex, there is apt to be an outlet for affection and devotion in the attachment to a member of the same sex. This attachment is generally known as a "crush" and has been described by L. S. Hollingworth (1928) as a "species of absorbing affection which involves jealousies and demands the exclusive response of the object to which it becomes attached." It

differs from friendship (1) in that there is a strong emotional absorption, and (2) in that it includes only two individuals, instead of several.

Crushes are often regarded as a form of sex perversion and are classed as a type of homosexual behavior. Should the crush persist into maturity, it may well be regarded as abnormal. But it is so common an experience between the thirteenth and seventeenth years that it must be regarded as a normal experience at that age. Bühler (1934) pointed out that crushes are common, as has been shown by the study of diaries written by girls in puberty and early adolescence.

Object of Crush.—Crushes are directed toward individuals for whom the young adolescent has *great admiration*. Teachers, governesses, older schoolmates, who are outstanding in their achievements in scholastic or extracurricular activities, or heroes and heroines of the movies and the stage, are the objects of adolescent crushes. When adolescents are segregated in schools or camps from members of the opposite sex, crushes are more frequent than in coeducational institutions. The crush is then usually directed toward a member of the same sex. This is much more common in the case of girls than of boys.

The attachment is usually for an individual slightly *older* than the other friends of the adolescent, who is outstanding in one respect or another. The adolescent is attracted to the older person because of appearance, manners, general sophistication, or achievement. More often than not, the individual is unlike the parents of the adolescent. This is apt to lead to jealousy on the part of the parents and resentment at the adolescent's desire to reform the parents to conform to the pattern of the adored one.

Crush Behavior.—Unlike homosexuality, crush behavior involves *little physical contact*. It is more apt to be a form of hero-worship in which deep admiration for and devotion to the loved one are experienced. Physical expressions are limited to hugging and kissing, as contrasted with stimulation of the sex organs which accompanies homosexual behavior.

Typical crush behavior has many of the characteristics of romances. It consists of a desire to be with, to do things for, and to make personal sacrifices for the benefit of the loved one. The use of terms of excessive endearment is very frequent. Imitation of the clothes, mannerisms, speech, and activities of the beloved occurs in the case of both boys and girls. Interest in appearance shows itself at this age, and the adolescent tries to make the most of his traits to attract favorable recognition from the beloved. Romantic daydreams are a common accompaniment of crushes.

The person to whom this typical crush behavior is directed is usually totally unconscious of it at first. Quite often it is an older person in

school or a friend of some member of the adolescent's family. He may in time come to recognize it as a crush and be amused and flattered by it. Especially in the case of women, the older individual enjoys the attentions and adoration of the younger person, as well as the power over that person. This is especially true of women whose lives have had few romances with members of the opposite sex and for whom therefore the crush is a form of compensation. The older individual, as a result, often encourages and prolongs the crush for selfish reasons.

While occasionally the older individual regards the crush as a joke and enjoys making fun of the younger person for the benefit of his personal friends, more often the older individual develops a real fondness for the younger and assumes a sympathetic attitude toward him. As the years pass, this may develop into a lasting friendship between the two. Occasionally, however, the older person gets sex gratification from the younger and thus brings about precocious sex behavior. This, in turn, leads to unhealthy attitudes about sex on the part of the younger individual which may later interfere with normal sex life and marriage.

Frequency of Crushes.—The frequency of crushes in adolescence depends to a large extent upon the type of *environment* in which the adolescent boy or girl is placed. In schools or camps where the two sexes are segregated, or in social environments where social taboos make association with members of the opposite sex difficult, crushes are a common occurrence. Modern parents and teachers, fortunately, have come to realize the serious consequences of crushes, in terms of adolescent unhappiness or unhealthy attitudes toward sex, and have tried to remedy the situations which give rise to it.

Hurlock and Klien (1934), in an anonymous questionnaire filled out by teachers, camp counselors, and adolescent boys and girls, found that most adolescents have one or more crushes, but that they are more frequently on members of the opposite sex than on members of the same sex. This, they concluded, was due to the fact that conditions in schools and homes have changed, so that association with members of the opposite sex may now take place without serious restriction or interference. When adolescents are segregated for two months or more, as happens in a summer camp, crushes on members of the same sex are very apt to occur. In all situations, they are much more common among girls than among boys.

3. "Calf Love."—In the normal pattern of development, there is a transition from *homosexual love*, directed toward a member of the same sex, to *heterosexual love*, directed toward a member of the opposite sex. As in the case of crushes, the affection is for an older person, but it differs from the crush in that it is directed toward a member of the *opposite sex*. In social situations which permit freedom of contact with the opposite

sex, crushes are infrequent, and "calf love" follows the age of sex aversion.

Sources of "Calf Love."—At the time when the body is making changes necessary for reproduction, the adolescent comes to regard members of the opposite sex in a very different manner from the way he did before. His interest is attracted to the physical development of the other, and this is accentuated by curiosity and daydreams of a sexual sort. Because of the sophistication and poise of an older man or woman, the adolescent is attracted to him or her rather than to an individual of approximately the same age. It is not at all uncommon for the boy of fifteen to seventeen years of age to fall in love with a woman twice that age, or for a fifteen-year-old high-school girl to "simply adore" a man in the forties.

This older person may be a friend of the parents, an outstanding member of the community, a teacher in high school or college, or a well-known person in public or theatrical life. As is true in the cases of crushes, the older individual is often totally unaware of the devotion of the younger person and has done nothing to encourage it. In other cases, the older person is flattered by the adoration of the adolescent and openly encourages it to satisfy his or her own vanity.

Characteristic Behavior.—The shy, self-conscious, "mooning" attitude of the adolescent toward the adored one has given rise to the name "calf love." To a casual observer, the adoration of the loved one is apt to be regarded as so unsophisticated as to be ludicrous, and this gives rise to teasing and joking comments. Needless to say, this accentuates an already self-conscious shyness and may lead to serious consequences in the form of intense emotional strain and fear of any further contact with the opposite sex.

As was true of crushes, "calf love" consists of *hero-worshipping* behavior. The adolescent tries to model his behavior and appearance to conform to the standards of the person with whom he is in love. He tries to be as grown-up and sophisticated as the woman with whom he has fallen in love, and it is not at all uncommon for the boy at this age to want to leave school so as to be able to support the woman as his wife. Young girls who fall in love with older men try to rival mature women in their appearance and behavior, in the hope of gaining the attention and admiration of the older man whom they adore. Should the older individual be married, the adolescent is extremely jealous of the mate and secretly wishes that in some way or other the marriage will come to an end.

"Calf love" consists of *worshipping from afar*, with little or no physical contact with the loved one. Because the loved one is usually much older than the adolescent and is likely to have affection for an individual older and more experienced, his attitude is apt to be one of amused tolerance

mixed with pleasure and flattery. In the case of the older man, if he is not already married, his interest may grow from the initial amusement he experienced to a deep affection which, in turn, will lead to marriage with the young girl. As most women who are adored by young boys are married or divorced, their attitude rarely ever involves romance. More often it is that of maternal interest in the welfare of the boy and affection similar to that shown for her own children. The divorced woman cannot, in most cases, afford to consider marrying the boy unless he is wealthy in his own right, and even then she is apt to find him too unsophisticated to interest her.

Emotional Accompaniment.—While to the spectator, a “calf-love” affair appears to be ridiculous, to the adolescent it is very serious and more often than not leads to unhappiness. When the adolescent discovers that the older person is not in love with him, he becomes very unhappy. This often leads to an attitude of inferiority which, unless handled successfully, may readily interfere with romantic love at a later age. The mental suffering which accompanies “calf love” is seen in moodiness, despondency, falling off of work, threats of suicide, and occasionally, homicide.

4. “Puppy Love.”—Beginning in the junior or senior year of high school, between the ages of seventeen and eighteen years, the adolescent transfers his affection from members of the opposite sex, distinctly older than he, to members of the *opposite sex of approximately the same age*. No longer is the adolescent interested in older men or women. They are now regarded as too old, “frumpy,” or “no fun.” Instead, the adolescent begins flirtations with his classmates, or members of the social group to which he belongs. This is the beginning of romantic love but, because it is still in a crude, juvenile form, it is usually known as “puppy love.”

Characteristic Behavior.—The typical “puppy-love” affair takes the form of mental fencing or “wisecracking.” Instead of the shy, tongue-tied attitude characteristic of “calf love,” the adolescent, who has had an opportunity to gain experience in handling members of the opposite sex, becomes bold and aggressive in his approaches. This boldness is to a certain extent a means of covering up embarrassment and self-consciousness, which persist even into the late adolescent years. Loud talking, giggling, laughing, slaps on the back, ruffling of hair, romping around, and sly, embarrassed hand holding are all part of “puppy love.”

To attract the attention of the opposite sex, both boys and girls wear loud-colored, extreme styles in clothing and make themselves conspicuous by adopting eccentric hair styles or by the use of too many cosmetics. The adolescent girl spends hours before the mirror and is as careful of her appearance for school as she is for a formal party. Playing games, especially those that give an opportunity for holding hands,

hugging, or kissing, is a popular pastime. When together in groups, adolescents usually pair off and engage in sly flirtations, even before their friends, for the amusement of all concerned. It is obviously a juvenile, unsophisticated type of love-making, which lacks the subtle aspects of romantic love.

The behavior of the "puppy-love" affair is very similar to that of romantic love except that it is cruder and lacks the subtleties of a romance among more mature individuals. While it lasts, the affair is very serious and intense, with the result that many adolescents neglect their work and their friends. They idolize one another, they want to be together constantly, are unhappy when separated, and spend the time when apart in romantic daydreaming, wondering what the loved one is doing, writing love letters or poetry, and in scheming to meet in spite of any barrier.

The adolescent tries to reform himself to conform to the ideals of the loved one, and this leads both boys and girls to acquire the social graces, such as dancing, and to take an interest in clothing and personal adornment, all of which, only a year or two before, they thought silly. The adolescent boy spends far more money than he can afford for gifts or entertainment of the loved one, partly to please her and partly to "show off." When together, they plan for their future and engage in simple, harmless petting. Occasionally this leads to sexual intercourse, but usually the girl is held back by fear of the possible consequences.

Love Object.—"Puppy love" sometimes occurs between friends of kindergarten days who, after years of scorning one another, now see themselves in a new light. More often, however, it grows up between boys and girls who live close together, attend the same school, and go to the same social functions, even though they have never before shown an interest in one another. A new boy or girl in the neighborhood will attract much attention and become the object of a "puppy-love" affair very quickly because of the glamour that comes with the new and unfamiliar.

End of "Puppy-love" Affairs.—Love affairs of this type are generally short-lived and end abruptly and dramatically, precipitated more often than not by a trivial quarrel. Both members are wretchedly unhappy, and contemplate or even attempt suicide. But in a short time they generally become involved in another love affair as intense and unstable as the one that has ended so recently. Four or five "puppy-love" affairs a year are not at all an uncommon experience during the high-school years. It is not surprising, then, to find the adolescent in a constant state of emotional turmoil, with consequent disturbances to health and work and a tendency toward moodiness and daydreaming.

5. Romantic Love.—Romantic love, which is more subtle, stable, and intense in form than "puppy love," appears first in late adolescence. If

the adolescent has been segregated from members of the opposite sex at the time when "puppy-love" affairs normally occur, he will be apt to experience them at the age when one would justifiably expect his love making to be of a more mature type. Romantic love needs the experience that comes from "puppy love" as its foundation. For that reason, it may not appear until adult years have been reached if its foundation has not been laid until later than the usual time. Romantic love is the most mature type and is the only form on which successful marriage can be based.

Courtship.—The pattern of courtship behavior, which accompanies romantic love, is rather stereotyped in form and has the approval of the social group. Any adolescent who deviates from the approved pattern is regarded as "fast," "not nice," or "loose." As a result, the individual is scorned or ostracized by those whose behavior is of a more conventional type. Because the adolescent learns what is socially acceptable or unacceptable through parental teaching or through actual experience, he attempts to cover up any flirtation that does not conform to the accepted pattern. Chaperonage, which is supposed to act as a check on unconventional behavior, is society's method of molding the adolescent romances into a form acceptable to the group as a whole.

Tendency to Idealize.—In romantic love, there is a tendency to idealize the loved one. No longer do boys and girls romp and wisecrack as they did in the "puppy-love" days. The loved one is the lover's ideal of the perfect boy or perfect girl, and qualities that belong to imaginary lovers are ascribed to the loved one. To live up to what is expected, the loved one tries to conform to the pattern of the ideal, which results, sooner or later, in disillusionment when the adolescent reveals himself as he really is. This disillusionment is more often the cause of breaking off of romances than any other thing and is thus a strong argument against early marriages which, except in unusual cases, are apt to go "on the rocks" in the same way as the adolescent romances do. "Love at first sight" is in most cases based upon an identification of a real person with an ideal taken from a daydream personage, from a character in a book, movie, or play, or from the memory image of a beloved parent who has died or for whom the adolescent still has a strong infantile attachment.

Bases of Attraction.—The question as to why some adolescents are more attractive to members of the opposite sex than are others has been extensively investigated. These studies have revealed that there are certain factors of advantage which cause the adolescent to be singled out by members of the opposite sex for attention, admiration, and love. The most important of these factors are:

1. PHYSICAL BEAUTY OF FACE, FIGURE, OR SOME ONE FEATURE, AS THE EYES, HAIR, LEGS, OR FEET.—Tradition and style are important

factors in determining what the adolescent considers beautiful. At one time fatness is preferred to thinness, curves to straight lines, and blond to brunet coloring. Perrin (1921) studied what the adolescent considers physically attractive in the case of college students. He found that traits closely associated with sex appeal had high positive correlation, as may be seen in the table below.

TABLE XLIX.—RELATIONSHIP BETWEEN PHYSICAL ATTRACTIVENESS AND SEX ATTITUDES

	Correlation
General physical attractiveness and appeal to opposite sex.....	+ .87
General physical attractiveness and appeal to same sex.....	+ .52
Appeal to opposite sex and appeal to same sex.....	+ .41
Liking for opposite sex and liking for same sex.....	+ .35
Appeal to opposite sex and liking for opposite sex.....	+ .58
Energy, vivacity, and appeal to opposite sex.....	+ .44
Energy, vivacity and appeal to same sex.....	+ .38
General social ability and physical attractiveness.....	+ .71
Good taste in dress and physical attractiveness.....	+ .83

Source: PERRIN, F. A. C. Physical attractiveness and repulsiveness. *J. exp. Psychol.*, 1921, 4, 217.

2. STYLE OF CLOTHING AND PERSONAL ADORNMENT ARE POWERFUL FORCES IN ATTRACTING MEMBERS OF THE OPPOSITE SEX.—Styles come and go, but the adolescent judges members of the opposite sex in terms of what is in style at the time. This puts great emphasis on the importance of clothing in adolescent years and explains why many girls will go undernourished or engage in petty thievery to be able to have the latest fashions. Adolescent girls worship any type of uniform. The more brass buttons and gilt braid the uniform has, the better they like it. They are so blinded by the halo surrounding the uniform that they cannot see the boy as he really is.

3. SIMILARITY OF INTERESTS AND RESEMBLANCES TO ONE ANOTHER IN A WIDE VARIETY OF TRAITS CAUSE ADOLESCENTS TO FALL IN LOVE WITH ONE ANOTHER.—This was true also of choice of companions in earlier years and is a very healthy factor in the choice of a life mate. Because many romances develop from friendships established during early adolescence, it is not surprising to discover that similarity of interests has been primarily responsible for bringing the two sexes together.

4. THE LOVED ONE GENERALLY IS SELECTED FROM THE SAME NEIGHBORHOOD AND THE SAME OCCUPATIONAL LEVEL AS THE LOVER.—It is true that occasionally a "Cinderella" is selected by one who is socially and economically above her, but these cases are so infrequent that they are front-page news. Bossard (1932) studied 5,000 consecutive marriage licenses in Philadelphia and found that one-third of the couples lived within five blocks of each other. One out of four lived within two

blocks of each other, and in only 17.8 per cent of the couples did one member live out of the city. Harris (1935) reported that 17 per cent of the 583 couples he studied lived within five blocks of each other, 41 per cent within a mile, and 36 per cent, a mile or over. The younger individuals in the group married closer to home than the older ones, and this was more frequent among the unskilled laborers than in the case of white-collar workers.

As the social and economic status of the family determines to a large extent the neighborhood in which the individual lives, it is not surprising to find that adolescent lovers are, for the most part, from the *same occupational levels*. Marvin (1938), in a study of 1,000 cases, found that "a girl's choice of her vocation has a directing influence in deciding from which occupational level she will marry her husband."

5. INTELLIGENCE AND HEALTH.—Mather (1934) asked high-school and college students to rank in order of preference 25 traits to be looked for in companions of the opposite sex. Among the high-school students, "brains" and good health ranked in first and second places respectively. There was much overlapping, showing few definite patterns. Among college students, on the other hand, there was a definite pattern. Abstract qualities, such as dependability and considerateness, ranked high.

Expressions of Romantic Love.—The sex development of the adolescent shows itself in different forms of expression, the most common of which is the *desire for physical contact*. What form this will take depends primarily upon what is socially acceptable at the time. "Spooning," "petting," and "necking" are all names applied to physical expressions of love in adolescent years. All of these arouse the sex glands and, if carried too far, may readily lead to "chemical intoxication." Like alcoholic stimulation, this can and often does lead to indiscretions in behavior. In most cases, however, it is kept under control by moral ideals and standards of conduct.

1. PETTING.—To find out what college girls' reactions to "petting" were, Smith (1924) used an anonymous questionnaire in the case of 171 college girls. A few questions, with their answers, are presented below:

"At what age were you first interested in 'going out' with boys?" Answers indicated the age range was ten to eighteen years, with a median age at fourteen years.

"Have you ever indulged in 'spooning' or 'petting'?" Ninety-two per cent of the group answered "yes."

"How old were you when you first 'spooned'?" The median age fell between sixteen and seventeen years, with a range from twelve to twenty-five years.

"What actuated you in 'spooning'?" The reasons given and the frequency of each were as follows: 52 per cent answered, "infatuation"; 40 per cent, curiosity; 30 per cent, "because others did it"; 12 per cent, "lack of courage to

resist"; 12 per cent, "desire to please the man"; and 11 per cent, "fear of being unpopular."

The motives for petting, as given by adolescents, Butterfield (1939) found to be as follows: admiration, in the form of an impulsive desire to touch and handle an admired person; erotic gratification; curiosity and exploration; and the gratification of the wishes of a companion. As girls reach the latter part of adolescence, they often object to petting, partly because it is no longer a novelty, partly because promiscuous petting becomes distasteful to them, and partly because they begin to think seriously about marriage, and they do not want to ruin their chances of marrying the man of their choice because of a reputation for indiscriminate petting.

2. SERVICES FOR THE LOVED ONE.—The *desire to do things for the loved one*, no matter how difficult they may be, occurs at this time. The greater the sacrifice involved, the happier the lover is. This tendency is more common in girls than in boys, though it is generally regarded by older members of society as bad form. The boy, instead of showering the loved one with gifts, tries to please her with acts of physical or mental excellence. In addition to this, the adolescent tries to keep in *constant touch* with the beloved, when parted, by letter writing, telephone calls, telegrams, or cables. In the intervals when they cannot keep in touch with one another by these methods, they try to keep in touch mentally by daydreaming in which the loved one plays a dominant role.

3. CREATIVE EXPRESSION.—The creative urge, which shows itself in *writing poetry, love letters, or composing music* in honor of the loved one, reaches its height between the ages of sixteen and eighteen years. Spending time in these ways, in addition to the time spent in daydreaming, gives little opportunity for studies or other work. It is not surprising then that the adolescent proves to be a poor student in school, or that he makes a poor showing in any job that he may have. After the creative urge reaches its height, the adolescent becomes critical of his work and questions its real merits.

4. CONFIDENCES.—When an adolescent falls in love, he invariably wants to *confide his feelings to another*. His best friends are usually treated as his confidants, and he expects them, on their honor, never to discuss the secrets told. Girls often find their confidences are revealed to others and, as a result, become more cautious. The *diary*, they find, is a safer confidant than any friend, and for that reason adolescent girls almost always go through this phase of development with a locked diary as a safety valve for their most secret thoughts and emotions.

5. JEALOUSY.—As is true of crushes and other forms of love in adolescence, romantic love is accompanied by intense *jealousy*. Anyone

who attempts to win the affections of the loved one, or anyone who shows even the slightest interest in the loved one, is regarded as a "love thief." So intense is the jealousy of the adolescent in such a situation that his behavior is often irrational to the point that it may lead to the harm of the individual who has been responsible for arousing it. When parted from each other, even for a few hours, the adolescent begins to wonder what the loved one is doing, imagines that he or she is having a good time with another person and intense jealousy occurs. Under such circumstances, it is not surprising that the adolescent is incapable of keeping his thoughts on his work.

6. **QUARRELS.**—Because many adolescent girls learn the trick of keeping the boy's interest in them alive by arousing his jealousy through real or feigned romances with another, adolescent romances are marked by many *quarrels* and misunderstandings. These are often so intense, so frequent, and so bitter that the romance cannot survive the strain and is broken as a result. Later, in retrospect, the adolescent may realize how baseless the quarrel has been and try to make amends by promising the loved one that "this will never happen again." In many cases, however, the romance is permanently broken, thus causing a period of intense mental suffering and grief for both the boy and the girl.

TABLE L.—PERCENTAGE OF BOYS REPORTING LIKING FOR ACTIVITIES WITH GIRLS

Age, years	Liked dancing, per cent	Liked parties with girls, per cent
Twelve.....	30.5	60.0
Thirteen.....	33.6	55.4
Fourteen.....	45.8	64.7
Fifteen.....	49.8	64.1
Sixteen.....	64.8	71.5
Seventeen.....	51.3	74.3

Source: PARTRIDGE, E. D. *Social psychology of adolescence*. New York: Prentice-Hall, 1938, p. 243. Quoted by permission.

7. **CONSTANT ASSOCIATION.**—The desire to be together constantly is strong in adolescent romances. Not only do adolescent lovers enjoy attending the same social functions, but they want to study together, attend athletic contests together, or engage in the same games and sports. There is thus a spirit of camaraderie about the romances of late adolescence that is not found in the "puppy-love" affairs. Given an opportunity to associate freely, as is possible in coeducational high schools and colleges, the adolescent romance comes to rest on a healthier, more normal basis of friendship and congeniality than appeared in the earlier love affairs. From the middle of adolescence, the romances should be

accompanied by good fellowship and should therefore serve as a foundation for marriage at a later date.

Play with members of the opposite sex has been investigated by Partridge (1938) in the case of boys of the adolescent years. In the table on page 383 are the percentages of boys who reported a liking for dancing and parties with girls.

A study of the figures given there reveals that the liking for play with members of the opposite sex increases as the adolescent grows older. The liking for parties with girls is at every age greater than the interest in dancing. Lehman and Witty (1927c) found a marked interest in "dates" and social dancing among adolescents between the ages of sixteen and twenty years.

Forbidden Romances.—Forbidden romances are much stronger and are marked by greater emotionality than are the romances that occur in the open with the knowledge and approval of the parents. When boys and girls are forbidden to see each other, a feeling of martyrdom grows up which motivates them to see each other at any cost. The element of secrecy thus adds to the lure of the romance and the feeling of martyrdom, which comes from the parental restraints, makes the stolen moments very intense. Under such circumstances, an unhealthy attitude is fostered, and the adolescents come to believe that their love for each other is far greater than it is. Should this result in an elopement, as often happens, disillusionment is very apt to occur when they realize that they have fewer interests in common than they imagined they had during the stolen moments of their courtship.

Ending of Adolescent Romances.—Not all adolescent romances have a happy ending. As a matter of fact, they more often end unhappily than happily. In large communities, it is more exceptional than usual when an adolescent romance ends in marriage. In small communities, on the other hand, it is taken for granted that the boy and girl romance will eventually end in marriage, and consequently it usually does, even though one or both individuals involved might prefer to have it end otherwise. Folsom (1934) found that 20 per cent of the adolescent romances he studied ended in geographic or social separation; 15 per cent in marriage; 13 per cent in dissatisfaction with the other person; 12 per cent in drifting apart; 10 per cent were terminated by the other person; 9 per cent resulted in the transfer of affection to another; and the remaining percentage ended owing to scattered causes.

UNHAPPY LOVE AFFAIRS

Thwarting of Sex Drive.—In the human being, there is a strong sex drive which must be inhibited or sublimated if the individual's behavior is to fit into the pattern accepted by the social group. During the

adolescent years, when the sex drive is especially powerful, it is intensified by movies, novels, plays, pictures, or jokes based on the subject of sex. If the individual has never been taught emotional control in childhood, he will have difficulties in controlling the sex emotion in adolescence. Instead of helping the boy or girl to master control of this driving force, as preparation for a happy and successful marriage, most adults attempt to restrain or inhibit it. Many of the heartbreaks of the adolescent years could be minimized if the adolescent had been properly prepared to meet the mature sex experiences of the adolescent romances.

Thwarting of the sex drive generally results in maladjustments: the two most common forms are excessive daydreaming and regression to infantile types of response—a tendency to go back to a phase in the sex development where the individual could make satisfactory adjustments and where his sex life proved to be a source of gratification to him.

1. *Excessive Daydreaming.*—Maladjustments resulting from unhappy love experiences often lead to excessive daydreaming of the “conquering-hero” type in which the dreamer compensates for unhappy reality. In many cases, this leads to a mental breakdown in adolescent years. Dementia praecox, one of the most common forms of psychosis, or “insanity,” in America today, starts during this period. In dementia praecox, the individual withdraws from unhappy reality and lives in a daydream world of his own making, free from the stress and strain of real life. As the beginning of dementia praecox coincides with the period of sexual adjustment in adolescence, it is logical to expect that unsatisfactory adjustment is one of the powerful contributing causes to that form of psychotic disturbance. Even though the maladjustments may not be severe enough to lead to a mental breakdown, they have the temporary effect of impairing the individual's health and making it impossible for him to do good work in anything that he may undertake.

2. *Regression.*—Regression, as the second form of adjustment to unhappy love experiences, is equally serious in its consequences as the maladjustments just described. Unhappy romances during adolescence may cause a regression to the crush or hero-worship type of behavior which is characteristic of the early teen age. The girl who is not popular with boys, or whose only romance is broken because the boy falls in love with a more glamorous girl, may try to make herself more attractive to boys, but she is much more apt to assume a “sour grapes” attitude toward them and regress to the crush behavior which she found very satisfying. If she has the qualities that older men admire more than boys of her own age do, her regression will be to the hero-worship stage, and she will probably, in time, marry a man much older than she.

Boys who are physically unattractive or who lack the social graces soon discover that they are not popular with the young girls of their set.

Their shyly given invitations are turned down with only a flimsy excuse, and the girls are obvious in their attempts to avoid being seen with them. The boy's hurt pride leads him to seek the companionship of older women who are flattered by youthful attention or of older men who are flattered by the interest the young boy takes in them. Instead of trying to make himself attractive to young girls, the boy who has regressed thus gains satisfaction from associations characteristic of his early adolescent years and may, as time goes on, be a typical man's man or may eventually marry a woman old enough to be his mother.

Effects of Regression.—Compensatory forms of behavior like those which occur in regression may prove to be satisfying at the time, but, in the long run, they rarely ever are as gratifying as a more normal form of behavior would be. For that reason, every possible attempt should be made to enable the individual to progress successfully from one stage to another in his sex development. As adolescence is the age when regression is more apt to occur than at any other time, it is especially important that the adolescent be given advice and aid in making satisfactory adjustments in his sex life.

CURIOSITY ABOUT SEX

In Early Childhood.—In the process of exploring his body, the baby sooner or later touches his sex organs. He then discovers that this results in a pleasurable sensation. By chance, he discovers his navel and derives fun from putting his finger in the "hole." Other than that, sex arouses no curiosity on his part until approximately the end of the third year, when the boy notices that his body differs from that of the little girl, that he stands up when he goes to the toilet while she sits down, and that adults have certain physical features, such as "bumps" and hair on the body, which little children do not have. He therefore asks straightforward, frank questions about these facts that mystify him and arouse his curiosity.

When a new baby arrives in his household or in the neighborhood, he is naturally curious to know where it came from. Any explanation that is logical he will accept, and this will satisfy his curiosity for the time at least. Later, around the fourth or fifth years, he may wonder why his parents sleep in the same room while adults who are not married sleep in separate rooms. If he has ever accidentally witnessed intercourse between animals or adults, he is curious to know "what they are doing." His attitude throughout is completely impersonal and objective, with none of the morbid interest that one associates with adolescent curiosity.

Questions about Sex.—The child's interest in facts connected with sex has been studied by Hattendorf (1932), who analyzed the questions children ask, as reported by their parents. The questions were classified

in eight groups and ranked according to frequency of occurrence. In the following table are given the different types of questions and the frequency of occurrence at the three age levels studied.

TABLE LI.—RANK OF INTEREST FOR 865 QUESTIONS OF CHILDREN TWO TO FIVE, 707 QUESTIONS OF CHILDREN SIX TO NINE, AND 191 QUESTIONS OF CHILDREN TEN TO THIRTEEN YEARS CLASSIFIED IN EIGHT GROUPS

Classification	Age, years		
	2 to 5	6 to 9	10 to 13
Origin of babies.....	1	1	2
Coming of another baby.....	4	2	1
Intra-uterine growth.....	7	7	8
Process of birth.....	5	3	5
Organs and functions.....	3	4	3
Physical sex differences.....	2	4	6
Relation of father to reproduction.....	6	6	4
Marriage.....	8	8	7

Source: HATTENDORF, K. W. A study of the questions of young children concerning sex: a phase of an experimental approach to parent education. *J. soc. Psychol.*, 1932, 3, 45.

A few of the most representative questions asked were: "Where do babies come from?" "Mother, why can't we have a baby?" "How does a baby grow in its mother's stomach?" "Why do mothers go to the hospital?" "Why do men have hair on their bodies?" "Do you have to be married to have a baby?" "Do you have to be married every time you have a baby?"

Object of Curiosity.—(Observations of the behavior of nursery-school children were made by Dillon (1934) to see if there were any indications of curiosity about sex. These observations were made during the dressing periods in the case of 11 boys and 11 girls, twenty-seven to forty-two months old, and eight boys and eight girls, forty-two to sixty-two months old. In the younger group, Dillon observed the manipulation of the genitals in 14 instances, only four of which were motivated by curiosity. In the older group, manipulation occurred 20 times, but in no instance was it due to curiosity. Children showed interest in their navels, eyes, hair, arms, and breasts. There was an interest in the bodies of children of the opposite sex. The older children showed a greater interest in their bodies than did the younger, as was indicated by the questions they asked about their bodies and a tendency in some cases to display exhibitionism. The older children recognized a difference between the sexes, mostly on the basis of clothes, hair, and names.

To discover how children react to the discovery of genital differences, Conn (1939, 1940) questioned children four to twelve years old by the

play-interview technique. The reports given showed that a large percentage responded to the first sight of genital differences with tranquil, unperturbed acceptance. Even though not prepared, the unexpected did not upset them. Some referred to the genitals as "funny" (meaning "strange"), as they were surprised at not seeing the same genitals in the opposite sex as they themselves had. Only a small percentage of the children indicated that they felt that something was "wrong," that girls had once had the same genitals as boys, but they had been cut off or broken off. There were varying degrees of curiosity about the differences in the genitals, but the average child was not upset about the matter.

In Adolescence.—Curiosity about sex, which is of a more or less objective type all during childhood, becomes a vitally important personal problem during adolescence. The result is a strong desire to get information from any source whatever, just so it gives the facts the adolescent wants. The less information he receives from parents and teachers, the greater will be his interest in talking about sex to his friends, in listening to smutty jokes and stories, or in reading obscene literature. In order to comprehend the complete meaning of what he reads or hears, the adolescent looks up new, technical words in dictionaries or scientific books, thus discovering a new source of information. Books "sold with plain covers" supply the adolescent with much of the information he craves.

Because the adolescent curiosity about sex is often of a morbid sort, it leads to an interest in pathology, abnormal psychology, and social diseases. This is sometimes the result of sex education which has placed emphasis on the abnormal aspects of sex as a preventative measure and has thus given the adolescent a distorted picture of normal sex life. It often leads to suspicions about personal defects or abnormalities and the fear of venereal diseases.

Sources of Information.—Every adolescent, at some time or other, engages in *conversations* about sex with friends of the same sex or with those of the opposite sex. The adolescent's motive may be a desire to gain information to satisfy his curiosity, which he has been unable to satisfy by other means, or it may be for the pleasure of exhibiting superior knowledge, or it may be for the vicarious sex thrill that comes from talking about subjects tabooed by adults. Conversations about sex thus have a cathartic value, even though they are temporarily stimulating and exciting in their effects on the individual. If the words used in these conversations are vulgar or smutty, it is purely unintentional. The adolescent merely uses words he has heard without knowing their true meanings or the social taboos surrounding them.

Peck and Wells (1923), in a study of college men, found that 28 per cent of them received their *information* about sex from companions, 27 per cent from home, 12 per cent from school, and the rest from scattered

studies. Of the 1,000 school and employed boys studied by Hughes (1926), 78 per cent reported that they got their information about sex from talk with other boys. Davis (1929), in a study of 1,200 women, found that less than one-third of them received their first information about sex from parents or guardians. The others got information from children, servants, or other sources.

Davenport (1923), in a study of the sex interests of girls in the late adolescent years, obtained data from spontaneous questions asked in writing by girls in a New York City training school for teachers. She reported that the sexual interests of this group were directed "to an unfortunate degree" toward sex superstitions. Knowledge of fundamental facts about sex, such as the organs and processes of reproduction, was very meager and inaccurate. The girls had little interest in the hygiene of personal sex life or in the care and normal functioning of the genital organs.

Effect on Adolescent.—Sex knowledge gained from smutty stories, scandal sheets, servants' gossip, thinly disguised jokes of adults, and other sources of an undesirable sort is not only unwholesome but dangerous. It creates an undue interest in sex with wrong emphasis on the information received, much of which is faulty. As a result, the adolescent is apt to develop an unfavorable attitude toward sex which may lead to an extremely prudish point of view or, at the other extreme, an attitude of promiscuity which leads to socially unacceptable behavior. In either case, the attitude is of so unwholesome a sort that satisfactory sex adjustments and a happy marriage are extremely difficult to attain.

Curiosity about sex very often leads to experimenting during adolescence. This is as ancient as the hills and is not a product of the automobile age, as many members of the older generation like to believe. Even in Puritan New England during the early days, "bundling," or going to bed together to keep warm, was an accepted custom for the young, even though it permitted experimenting without restraints. "Petting" and "necking," as the younger generation calls experimenting, is engaged in to gain new and more intense thrills of an erotic sort. It is an introductory step to sexual intercourse which often leads to the act instead of stopping at the introduction. Drinking, lack of chaperonage, the use of automobiles to get away from others, contraceptives, and many similar devices of the modern era make experimenting increasingly easy and release the inhibitions that formerly acted as checks on behavior that lacked the stamp of approval of the social group.

SEX EDUCATION

Since the First World War, there has been a radical change in social attitudes about sex. The old idea was that the child should be kept free

from all knowledge of sex until adolescence. In the case of girls of the well-to-do social classes, where every possible attempt was made to shelter them and retain a childish purity in regard to sex, information about sex was not given until just before marriage. The modern point of view is radically different from this. Now, it is believed that the best time to teach the child is when he begins to show an interest in sex, and enough information should be given to him to satisfy his curiosity.

Two Types of Sex Education.—Sex instruction, if it is to be complete and adequate to meet the needs of present-day life, should be of two types: *constructive* and *preventative*. *Constructive education* should build up healthy attitudes about sex and marriage, while *preventative education* should not terrify the child because of the morbid emphasis on the ill-effects that come from sexual promiscuity but should teach the child what to avoid in his sexual relationships, just as he is taught what to avoid because of the possible danger to him in other aspects of his life. If the preventative teaching be of this type, it will tend to establish a healthy attitude of caution which will have a pronounced effect on the behavior of the individual, especially during the adolescent years.

Constructive Education.—Giving the child scientific information about sex is not enough. If the constructive type of education is to be complete, it must include the teaching of what the social group to which the individual belongs expects and demands in sex behavior. The child must learn what is permitted and what is not and must realize that any deviations from the socially approved pattern will result in condemnation from the group as a whole. He must be taught, for example, how much love-making will be tolerated in petting and when sexual intercourse will be permitted.

Another aspect of constructive sex education should consist of knowledge about the effects of sex on health. This is especially important during adolescence. Girls, in particular, should be taught that menstruation normally has some effect on their physical and mental condition, and they must learn to take a sane attitude toward this, instead of believing that they are discriminated against and mistreated by nature.

Preventative Education.—Unfortunately, too much emphasis is placed on the preventative form of sex instruction, with the hopes of inhibiting behavior which is socially unacceptable or tabooed. This results in emphasizing the gruesome aspects of venereal diseases, which are regarded as the penalty for the irregular sex behavior. The girl is led to believe that pregnancy is the certain consequence of promiscuous sex behavior, and emphasis on shame and social ostracism is designed to arouse an attitude of fear and caution on her part.

A better way to give preventative education in regard to sex would be to give preventative education about the causes and effects of pro-

miscuous sex behavior, and then let him draw his own conclusions about how he should behave. This would result in a more healthy attitude toward the whole matter and would eliminate hoodoos and morbid fears.

Best Time for Sex Education.—There is no one best time to give sex instruction. It varies from one child to another and should be determined by the child's curiosity. As a general principle, the time for giving sex instruction and the amount given should be determined by the child's questions rather than by any set rules. Whenever the child asks questions about sex, he should be given information in a correct, matter-of-fact way, just as he would be if his questions dealt with the weather or why we live in houses instead of huts.

In every circumstance, children should be given complete sex instruction before they enter the stress and strain period of puberty, as a safeguard against the emotional reactions that invariably accompany the physiological changes occurring at this time. This should not only include information about the changes that will take place in their bodies, but they should learn what the purposes of these changes are as a preparation for mature sex life. Above all, emphasis on the pathological aspects of sex should be avoided. Instruction about this aspect of sex should be deferred until late in adolescence and if possible should be given by doctors or teachers to insure a correct scientific knowledge of the subject.

SEXUAL MALADJUSTMENTS

Maladjustments in the sex life of the individual are more common experiences than one is apt to realize. They may originate from some abnormal physical condition, but they are usually due to an unwholesome attitude which has resulted from faulty information about sex, coming from an unsatisfactory parent-child relationship or from unhappy experiences in normal relationships with members of the opposite sex. This leads the child to seek affection and attention from sources other than those which supply his wants or needs.

Maladjustments in Adolescence.—While adolescence is the age of normal sex development, it is also the age when sexual maladjustments of a serious type most frequently develop. All forms of sexual abuse, such as masturbation, homosexuality, and sadism occur at this age. Statistics of prostitution have shown that a large percentage of prostitutes begin their careers between the ages of fifteen and eighteen years. Too free use of alcohol on the part of adolescent boys and girls causes them to do many things that they would not do under normal conditions. Sometimes the chemical intoxication that comes from excessive drinking arouses homosexual tendencies, causing the individual to seek sexual satisfaction from members of the same sex. Sometimes it leads to masturbation, but most often it leads to seeking gratification from

members of the opposite sex through "petting" or through visits to bawdy houses where often the adolescent is infected with the germs of syphilis.

The most common forms of sexual maladjustment to appear in childhood and adolescence are:

1. *Masturbation* consists of stroking, fondling, or playing with the genital organs because of the pleasurable sensations derived from it. During the first six years, the child at some time or other, in the process of investigating his body, discovers by chance that touching the genitals gives more pleasurable sensations than touching any other part of his body. It is not surprising that the little child repeats the act, especially when he is alone and has little to engage his attention and interest. Dillon (1934), in a study of nursery-school children, found that masturbation served to release tension. Young children, he found, make no attempt to conceal play with their sex organs, nor do they show signs of guilt or shame when caught in the act.

The school child, who has learned from scoldings or punishment that playing with his sex organs is considered naughty, generally practices masturbation when alone. If he has not discovered the pleasurable sensations that come from playing with the sex organs through his own exploration, he generally learns to do so by watching other children or from the suggestions of older children. Almost always, these practices are carried out in the absence of adults, when the child is in bed, so that it is impossible to know just how frequently they occur.

During adolescence, as a result of the development of the sex organs, comes a new sensation in them which leads the adolescent boy or girl to experiment to find out what causes this sensation. It is primarily a form of sex curiosity and, in most cases, is abandoned when the curiosity has been satisfied or when the adolescent learns that it is injurious to health or is a socially disapproved form of behavior.

FREQUENCY OF PRACTICE.—Masturbation is *more commonly practiced than is generally believed*. Davis (1929), in a study of the sex life of more than 2,000 women, reported that of those who admitted masturbating at some time during their lives, over one-third of the unmarried and over one-half of the married women said they learned the practice from others, generally from another girl. More than half of them had acquired the practice before they were fifteen years old. Figure 55 shows the frequency of masturbation and other sex experiences in the group studied. In a follow-up study, based on information given by married women, Davis (1925) reported that 292 of the 1,000 women studied had practiced masturbation. Only 62 continued the practice after marriage. Most boys at some time or other engage in masturbation, owing to the accessibility of the penis. It is less common in girls than in boys. Pullias

(1937) estimated that 70 per cent of the boys he studied masturbated at some time or other.

TRADITIONS ABOUT MASTURBATION.—The popular belief is that masturbation has devastating effects on the mind and body of the individual. Feeble-mindedness and insanity are often believed to be directly caused by it. Because masturbation is so frequently found among feeble-minded and insane individuals, the belief grew up that these abnormal conditions were caused by it. Pimples and other common accompaniments of puberty changes have also been ascribed to masturbation, and

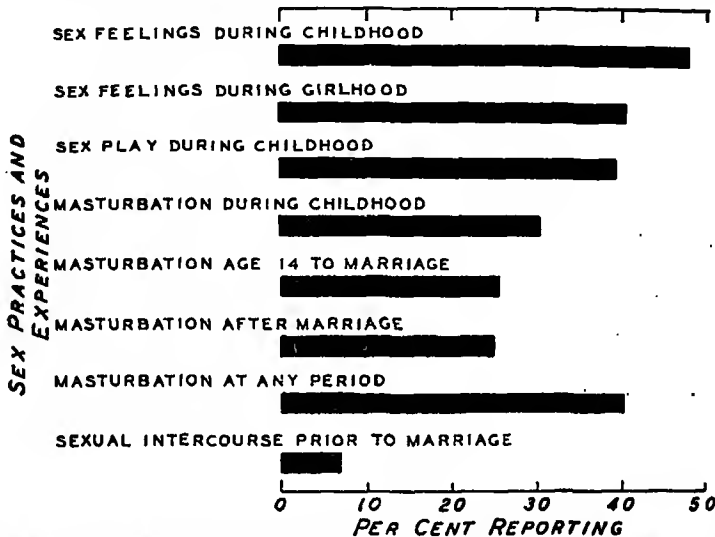


FIG. 55.—Percentage of married women reporting various sex experiences and practices. (Based on data of K. B. Davis: *Factors in the sex life of twenty-two hundred women*. Harper, 1929. From F. K. Shuttleworth, *The adolescent period*. Monogr. Soc. Res. Child Developm., 1938, 3, No. 3.)

the adolescent believes them to be the outward symbol of a shameful act, which causes him much mental anguish.

As a matter of fact, the emotional effects of masturbation, which result in attitudes of shame, timidity, fear of loss of manhood, and inferiority, are far greater than the physical effects. The physical effects are really negligible and consist mostly of temporary fatigue, sleepiness, and release of physical tension. The mistaken attitudes about the evil effects do more harm than the actual practice itself. In reality, masturbation is noninjurious unless it is excessive. At times, it serves the good purpose of relieving sex tension.

In a study of male college freshmen at Duke University, Pullias (1937) found that they had many misconceptions about the evil influences of masturbation. In the table below are given beliefs held and the frequency of occurrence:

TABLE LII.—THE BELIEFS OF SEVENTY-FIVE YOUNG MEN CONCERNING THE EFFECTS OF MASTURBATION

Belief	Number of young men	Percentage of total*
Some type of serious damage.....	62	82.7
Serious physical damage.....	33	44.0
Serious mental damage.....	28	37.3
Serious moral damage.....	18	24.0
Serious social damage.....	9	12.0
Harmful (not specified).....	6	8.0
Direct cause of insanity.....	12	16.0
Not seriously harmful.....	5	6.7
No response.....	8	10.7

Source: PULLIAS, E. V. Masturbation as a mental hygiene problem—a study of the beliefs of seventy-five young men. *J. abnorm. (soc.) Psychol.*, 1937, **32**, 221.

* A certain amount of overlapping occurred, due to the fact that some young men believed that masturbation has several types of effect.

PREVENTION OF MASTURBATION.—In young children, masturbation can be prevented by eliminating the stimulation of the sex organs. This can be done by using loose, comfortable clothing, by avoiding urine acidity and constipation, by keeping the child so active that he will use up excess energy, and by proper explanation of why it should not be engaged in, as soon as the child is old enough to comprehend what is said to him. The less attention given, the better. If the child's interests are distracted from himself and his own body and diverted into other channels, masturbation generally ends. As the child reaches adolescence, he is very apt to engage in masturbation for a short time. With normal adolescent romances, however, he develops new and varied interests outside of himself. Through love-making and marriage, he usually finds a satisfactory outlet for the pent-up sex energy.

2. *Exhibitionism* is a form of sexual maladjustment in which the individual derives great mental satisfaction from displaying the genital organs to others. This may consist of display at a distance, or close at hand with encouragement to the spectator to touch it. There is no attempt at sexual intercourse. It is caused by curiosity and a strong desire to attract attention at any cost. Among children, exhibitionism is practiced in the presence of members of both sexes, without any definite preference. During adolescence, however, it is almost always limited to members of the opposite sex. In very few cases, at any age, is exhibitionism displayed by girls, while it is very frequent among boys, especially at the onset of puberty.

3. *Sadistic behavior* consists of inflicting mental pain on the loved one through thoughtless or intentional cruelty, in one form or another. It is

a form of behavior which begins in childhood by doing such things as robbing birds' nests or pulling wings from butterflies or legs from grasshoppers, to see how they can get along without them. Bullying and teasing others, especially girls or smaller boys, is very common in large, well-developed, masculine boys. They also enjoy wrestling and derive great pleasure from crushing their opponents.

With the approach of puberty, corporal punishment may predispose the youth to seek revenge by inflicting pain on others. During adolescence, sadistic behavior takes the form of inflicting mental pain by teasing, scolding, or bullying the loved one, as an outlet for a desire to feel important. It is much more frequent among boys at every age than among girls. If found in boys who are suffering from some other neurotic tendency, it may lead to crimes, especially bodily attacks or murder.

4. *Masochistic behavior* is closely related to sadistic behavior, in that it gives the individual satisfaction from suffering pain. It differs, however, in that the individual derives sexual pleasure from suffering at the hands of another. Effeminate boys and weak girls often enjoy being roughly handled, especially by a strong member of the opposite sex. It also differs from sadistic behavior in that it is found with almost equal frequency among individuals of both sexes.

5. *Fetichism* consists of fondling and kissing objects belonging to the loved one. During the crush age, this is a very common form of behavior and is often regarded by adults as silly without realizing that it has a more deep-seated and emotionally colored significance than appears on the surface. Anything belonging to the loved one, no matter how trivial it may be, is cherished. If the possession has been used by the loved one, its value is so enhanced in the mind of the child or the adolescent who experiences the crush that it is kept under lock and key as a rare treasure. Should anyone regard the treasured article at its face value, the youth becomes emotionally disturbed and looks upon this as a personal insult. Fetichism is a common accompaniment of the crush but is relatively infrequent in other forms of love.

6. *Narcissism* in young children consists of an overly developed interest in one's own body and its functions, as well as keen enjoyment in looking at one's body, stroking and fondling it. It is often accompanied by masturbation. The name "Narcissism" has come from the mythical youth, Narcissus, who refused the love of the nymph, Echo, fell in love with himself, and drowned while looking at his image in the river. This form of sexual maladjustment is very frequent in puberty, and because it is almost universally found at that age, it may be regarded as normal. Should it persist much after puberty, it makes the transition to normal adult love for a member of the opposite sex almost impossible.

7. *Homosexual behavior* consists of sexual behavior of an intense and intimate sort between two individuals of the same sex. In it there is an attempt to reproduce the sexual gratification which is normally experienced in relationships with members of the opposite sex. It is somewhat more common among girls than boys and is usually found in isolated groups, as camps, boarding schools, colleges, and reformatories. It is thus primarily the result of environmental influences rather than any one other factor. In some cases, it is caused by unfavorable attitudes arising from unhappy childhood experiences, which have resulted in unfortunate conditioning by home examples or parental attitudes, or it may result from direct, personal experiences of an abnormal kind. It may be considered normal when it is the only adjustment possible in the circumstances and abnormal when it is the preferred type.

8. *Oedipus complex* is an abnormal attitude in which the boy loves his mother and is sexually jealous of his father and hates or fears him. The name has come from the Greek myth of King Oedipus, who killed his father, married his mother, and finally did penance for both sins by blinding himself. Intense affection of the son for his mother beyond the early years of childhood shows that sexual development has been arrested at a level below that expected of an individual of more mature years. When the "mother image" dominates the adult, it makes a happy marriage impossible.

9. *Electra complex* is similar to the Oedipus complex, except that it refers to the girl's love for her father, which results in her resenting her mother's intimacies with the father. It is much less frequent than the Oedipus complex and, as a result, is a less serious factor in normal sex maturity.

CHAPTER XV

FORMS OF SELF-EXPRESSION

Every normal child wants to be a part of the social group, and he also wants to be recognized by it. He uses whatever means he finds successful to put himself in the spotlight, and he derives keen enjoyment from the recognition he receives. The desire to impress his companions as well as the adults of his environment often brings the child into conflict with adult regulations and the codes of the social group. Nevertheless, the desire for social recognition is so powerful a motivating force that it may, when thwarted, lead to crime because of the publicity that crime brings. It is not at all uncommon for the adolescent to deprive himself of food or other necessities to obtain the clothing and finery that are sure to attract attention.

Desire for Attention Appears Early.—Even a young baby likes to be noticed and to hold the center of attention. From the fourth or fifth month, consciousness of self reaches a point in the development of the child where it requires an outlet. Long before the baby can talk, he “senses” that he is the center of admiration and attention. He enjoys being noticed by others and is unhappy when no one pays attention to him. The more accustomed he is to attention, the more difficult it will be for him later, when he discovers that those outside of the home do not give him the attention he received at home. This is especially true of first-born or only children. To compensate for lack of attention, they learn, by trial and error, new tricks that will restore them to the center of the stage and the limelight which they learned to enjoy at home.

The tendency to “show off,” for the purpose of winning attention, is strong during the latter part of childhood. But, unlike the baby, the older child regards the source of approval as important as the approval itself. The enjoyment from being noticed is greatly enhanced if it comes from the gang or an admired adult. The adolescent is “approval thirsty” to the extent that he makes a conscious attempt to be noticed. This is more true of the latter part of adolescence than of the early part, when the adolescent becomes, for a time, timid and self-conscious because of his awkwardness. Like the child, the adolescent always looks to see if others are paying attention to him, and if not, he tries out another method with the hope of gaining the attention he wants.

Desirable Outlets for Self-expression.—Children need many healthy forms of self-expression to avoid feelings of inferiority that come from

thwarted self-assertion. But no child, because of his limited experience and knowledge of what is socially acceptable and what is not, can be expected to establish healthy forms of self-expression without adult direction. All forms of self-expression give the child satisfaction, but they must, at the same time, be socially acceptable if they are to be encouraged and if they are to prove satisfactory as the child grows older. The child will, for example, derive as much pleasure from drawing pictures on paper or a blackboard as from scribbling on the wall or sidewalk, but he must be directed in the use of the former medium and discouraged from using the latter.

Social Attitudes toward Self-expression.—Many years ago, it was believed that a “child should be seen but not heard,” and no attempt was made to give the child a chance to express himself. Shortly after the turn of the twentieth century, the Freudian emphasis on the bad effects that may come from thwarting a natural tendency, combined with the teachings of the educational reformers, led to a complete reversal in educational philosophy, and the child, instead of being thwarted, was encouraged to express himself however he wished. It soon became apparent that the child’s methods of self-expression were not always of the best type. The result is that today a middle-of-the-road policy has been adopted which stresses directed self-expression as the most satisfactory way of meeting the child’s needs at the moment while at the same time establishing habits of self-expression which will prove to be useful throughout life.

COMMON FORMS OF SELF-EXPRESSION

There are many desirable forms of behavior which give the child an opportunity for self-expression. The child is not apt to discover them of his own accord. Through observation of adults’ reactions to his behavior, the child learns that he gets attention from certain forms of behavior and not from others. He therefore selects the types of behavior that give him the greatest attention, and repeats them. In the remaining pages of the chapter, different forms of behavior that are commonly used by children as outlets for self-expression will be discussed.

1. VOCALIZATION

Crying.—Before he is three months old, the normal baby has learned that *crying* is a sure method of getting attention. He also learns that when he does not cry, no one pays much attention to him. If, therefore, he wants attention, he calls for it by loud cries. If the baby is permitted to get what he wants by crying, he will continue to use crying as a form of self-expression. But as the years go on and he finds that play with

children is more fun than play with adults or alone, he will discover that trying to be in the limelight by crying not only does not work but that it will win for him the scorn of his playmates who label him a "cry baby."

Domination of Conversations.—Even before he can talk, the baby attempts to join the conversation of others by *babbling*, often in such loud tones that he cannot be ignored. Later, when he has learned to talk, he attempts to dominate the conversation by talking faster and in louder tones than anyone else, thus making it impossible for others to "get a word in edgewise." Very often, the young child's questions are not motivated by a desire for information but by a desire for attention. He discovers that, when he makes statements of fact, he gets less attention than when he asks questions. He even asks the same question time after time and pays little attention to the answer given, because he already knows what it is.

Vocalizations in Later Childhood.—During the latter part of childhood, the child's ability to use his vocal mechanism with greater skill than he previously could leads to an interest in coining new forms of "secret language," in sign or speech form, partly to be able to communicate with the other gang members without having others know what it means, but mostly because "secret language" gives a feeling of superiority. As a result, the child believes he is "putting something over" on others. The more curiosity he can arouse about his secret language, the more pleased he is. He also enjoys *vocal gymnastics* in the form of alliterations or the pronunciation of difficult words. He will practice such familiar sentences as "Peter Piper picked a peck of pickled peppers" time after time, to see how quickly he can say them without mispronouncing a word. *Shouting, screaming* to one's friends, and *laughing uproariously* on every possible occasion are common forms of attempting to attract attention at this age.

Boasting.—Every child enjoys boasting, and thus boasting may be considered a common form of self-assertion. What the individual boasts about, however, changes with age. Young children boast about material possessions, such as clothes, toys, family cars, or servants. The older child boasts more about his strength and skill in games than about his material possessions. During adolescence, boasting is about popularity, "conquests," being wild, and doing daring things. It is true that the adolescent, like the child, boasts about material possessions, but in a more subtle form. He also talks about his family, their achievements, and their activities, and he tries to give the impression that they have greater social prestige than they have. Hetzer (1930) studied boasting in different age groups and found that the greatest amount occurred between the ages of eight and twelve. Boys of this age, she found, boast about their strength as a part of their normal talk.

Slang.—Slang, as a means of "showing off," is widely used throughout childhood. Even though the young child may not know the meaning of the word or phrase he picks up from the conversations of older children, he nevertheless uses it, partly because it helps him to identify himself with the older group and partly because of the pleasure he derives from the shocked reactions of parents or other adults. The child feels that slang expressions, such as "Oh yeah," "I'll say," "says you," "O.K.," "swell," or "lousy," help to create the impression that he is a good sport. In adolescence, slang not only serves to create the impression that the adolescent is a good fellow but, like the child, he enjoys being able to stir up shocked reactions on the part of adults. "Wisecracking," which involves the use of slang words and expressions to give an air of sophistication, is a common accompaniment of early adolescent romances.

Use of Unusual Words.—To create the impression of superior intelligence and knowledge, the adolescent likes to use long and unusual words. These are sometimes picked up from the conversations of adults, or they are learned in connection with some course of study. They occasionally come from a search through the dictionary in a conscious attempt to find words that will "make people sit up and take notice." The use of foreign words or phrases, as "chic" and "faux pas," is, according to the adolescent's point of view, a sign of superior education and culture.

Adolescent Vocalizations.—Boys, during the adolescent years, use puns, loud talk, shouting, laughing boisterously, and squealing to attract the attention of others. Girls, on the other hand, regard these methods as boorish and consequently scorn them. They attempt to create favorable impressions by affecting pronunciations that they admire, especially if they are different from those used by other individuals in that community. A Northern girl may, after a short visit to the South, cultivate a heavy Southern accent, while a Southern girl may try to talk like a typical New Yorker. Because she realizes that a pleasing voice attracts favorable attention, the adolescent girl tries to improve the tonal quality of her speech. She even goes so far as to practice vocal exercises without prodding, and she is seriously interested in the speech classes at school.

2. EMOTIONAL OUTBURSTS

The young child learns, at a very early age, that he can attract attention and dominate the household very easily by an emotional outburst (see Fig. 56), which usually takes the form of a temper tantrum of greater or less intensity. At other times, it consists of spasms of fear, often exaggerated to gain sympathy, or semihysterical giggling which, like fear, is often assumed when the child discovers that it calls attention to himself. Emotional outbursts of anger and fear are generally limited to the early years of childhood because the child eventually discovers that,

while he gains attention through them, the attention is of an unfavorable type. Giggling and laughing, on the other hand, are more characteristic of late childhood and early adolescence.

"Negativism," or contrariness, is a stubborn resistance to authority which occurs so frequently around the age of two or three years that it may be regarded as a normal form of self-assertion in early childhood. It is caused by the child's desire to assert himself and to prove that he has a mind of his own. In some cases, the child's negativism is his reaction to people he dislikes or to interference with activities he is carrying out. The child soon learns that this is not a socially acceptable form of self-assertion, and he usually abandons it by the time he enters school.

3. MISBEHAVIOR

Most little children learn, unfortunately, that they get more attention when they are naughty than when they are good. They therefore are often intentionally naughty because they feel that they are being ignored. Even though they are punished for it, the pleasure they have derived from being in the spotlight far outweighs the temporary discomfort of the punishment. Much of the destructiveness of young children is not caused by clumsiness or lack of motor control but by a willful attempt to attract attention to themselves.

At the Gang Age.—The gang delights in willful misbehavior because it gives each member a sense of personal importance. If the misbehavior takes the form of annoying others, such as ringing door bells, letting air out of automobile tires, or drawing pictures on pavements, houses, or fences, the gang members derive special pleasure from feeling that they are masters of the situation. Even though misbehavior in school, in the form of whispering, passing notes, or tormenting other pupils, is sure to result in some form of punishment, the youth feels that it is well worthwhile because all eyes in the classroom are focused on him, and all pupils listen attentively while the teacher scolds or administers punishment.

In Adolescence.—At no age is willful misbehavior so great a source of satisfaction to the individual as during adolescence. The adolescent regards rules and laws as a challenge, and if he can break them without being caught, he feels very superior to the law-enforcers. When smoking and drinking are forbidden, many an adolescent smokes and drinks when-



FIG. 56.—Crying is often a bid for attention. (From *Parents' Magazine*, October, 1937. Photograph by Black Star. Courtesy of *Parents' Magazine*.)

ever possible, not because he enjoys them, but because it gives him a sense of triumph. He drives his car as fast as it will go, goes around corners on two wheels, honks his horn when there is no real need for it, and in general makes himself a nuisance as well as a menace to the safety of others. All this is done because he wants to see if he can break speed and other traffic regulations without being caught. In boarding schools, camps, or colleges, lights-out rules or dormitory restrictions are generally regarded as challenges by adolescent boys and girls.

4. DESIRE FOR INDEPENDENCE

From early in babyhood, the child likes to be independent and to do things for himself. This desire becomes so strong at times that it leads to revolt against any aid, even though the little child is incapable of doing things for himself as quickly or as well as others can do them for him. The baby wants to feed himself, dress and undress himself, and play with his toys in his own way. By the time he is three months old, the baby can amuse himself with his toys, and as soon as he can creep, he can get what he wants without aid, provided things are within his reach.

As the child grows older, he wants the privilege of selecting his clothes, food, toys, playmates, play activities, and the books he reads. In fact, he likes to feel that everything he does is of his own choice and volition. After he has learned to read, he even resents being read to because he associates it with the time when he could not read for himself. If he can earn money, even though it be only a few pennies, he derives tremendous satisfaction from feeling that it is his to do with as he pleases.

Peak in Adolescence.—The desire for independence reaches its peak during adolescence. The adolescent wants to prove to the world that he is grown-up and can control his own life. Parents often find it difficult to adjust themselves to this point of view, and they cannot understand why the adolescent willfully goes ahead and makes mistakes which they could so easily help him to avoid. If the adolescent does, at a later time, call for help, parents too often take the "I told you so" attitude which serves only to intensify the adolescent's resolve to be independent in the future, no matter what the cost.

The adolescent's desire for independence shows itself in the demand for a room of his own, his own possessions to do with as he pleases, clothing of his own choice, and the right to select his own friends. Both boys and girls, during late adolescence, resent adult supervision over their affairs and feel that they should have a latchkey, to come and go as they please. They like to travel alone, to make their own arrangements, and to take care of their own baggage. Nothing is more humiliating to an adolescent than to have the family take him to college.

Block's Study.—Block (1937) asked junior- and senior-high-school boys and girls to check a list of 50 problems which frequently cause adolescents to experience conflicts with their mothers, as, for example: (1) "Insists upon nagging me regarding what I wear and how I dress"; (6) "Pesters me about my table manners"; (40) "Insists that I tell her for exactly what I spend my money"; and (43) "Insists that I take my sister or brother wherever I go." Block found, from the data obtained, that most conflicts are due to the following causes: (1) differences in thinking regarding personal appearance, habits, and manners; (2) differences in thinking regarding vocational, social, recreational, and educational choices; (3) differences in thinking regarding the value of certain activities, habits, attitudes, etc., in the attainment of goals; and (4) differences in philosophy regarding recreational and physical activities. Many difficulties were found to be due not so much to the situations themselves as to the way they were handled by the mother.

5. DESIRE TO APPEAR OLDER

Every child, at every stage of development, tries to appear older and more sophisticated than he is. The little child feels important when he is allowed to stay up longer than the younger children of the household or when he is allowed to come to the family table. Murphy (1937) found that, in the preschool years, children are particularly conscious of their own "bigness," and often show evidence of longing for the freedom that accompanies being big. The first long trousers, for boys, a more grown-up style of hairdress for girls, the right to drive a car, to smoke, or to carry a latchkey are all signs of growing up.

6. POSSESSIONS AND RESPONSIBILITIES

Between the first and second years, babies become aware of their own possessions, such as their toys, clothes, and books. They resent having others play with them or even touch them. The possessive attitude toward their own things becomes so marked in early childhood that it is difficult to persuade the child to share his playthings with others, and this is responsible for many of the quarrels that occur.

With possessions comes the responsibility of taking care of them. Too often, parents who can afford to do so deprive their children of the satisfaction that comes from assuming responsibilities, no matter how trivial they may be, on the grounds that they involve menial work. As a result, the child is freed from all responsibilities, and tasks which he himself would enjoy are turned over to paid servants. Other parents assume responsibilities for their children so that they may have a happy, carefree childhood. Whatever may motivate parents to free their children from responsibilities, it is a mistaken kindness.

As the child grows old enough to be entrusted with errands in the neighborhood, it makes him feel very important to be sent to the store for a purchase or to be permitted to pay a bill. The responsibility of going to school alone or to the corner to mail a letter appeals strongly to the child. As he approaches adolescence, he not only wants to assume more responsibilities but he resents it if he is not given the responsibilities that his friends have. Self-government offers a splendid outlet for this form of self-expression.

7. CHOICE OF LIFE CAREER

In Childhood.—Studies of vocational interests of elementary-school children have shown that by the time the child reaches the third or fourth grade, he has made a definite choice of vocation. This choice may be based on what he has heard about the vocation from conversations of adults or his contemporaries or on knowledge derived from movies, books, or magazines. Freeston (1939) found that relatives were less often the inspirers of the children's choice of occupations than their heroes and heroines. The boys were most affected by the world of sports and the girls by the movies. In the group of elementary-school children studied by Jersild, Markey, and Jersild (1933), 47.1 per cent said that they wanted to go into the professions or executive business positions when they grew up. Of this group, 33.2 per cent chose nursing, aviation, clerical work, skilled labor, and petty trades; 6.8 per cent selected semi-skilled and unskilled labor; while only 5 per cent said that they were undecided. The children with high intelligence-quotient scores chose mostly the higher occupations, while those with the lower intelligence-quotient scores more often chose the petty trades, skilled labor, and clerical work. Figure 57 shows graphically vocational choices.

In Adolescence.—By the high-school age, most adolescents have started to think about their futures, and many of them have definite ideas about what they want to do. Often they change their choices several times a year, but this shows that at least they are considering the matter seriously. In many cases, their choices lack practical significance because they are based more on the wishes than the abilities of the individual. Change in vocational choice is more serious than it may appear to be, because the change in vocational choice influences the course of study which had been undertaken as a preparation for a chosen career.

The adolescent, as contrasted with the child, is more influenced by the people he comes in contact with than by his heroes or heroines in the choice of his vocation. With each succeeding year, he becomes increasingly aware of the fact that his choice of a career must be determined to a certain extent by his own abilities and by the type of education he has had. In many cases, the adolescent seeks advice from parents and

teachers in the choice of his career and is guided by the advice he receives from them. Beeson and Tope (1928), in a study of the vocational choices of high-school students, reported that the parents were the most important influences in determining the choice and that teachers, especially in the case of girls, were the second most important factor.

Franklin (1924) asked students in the first year of junior high school to indicate what they wanted to do when they finished school. He found that less than 2 per cent had no choice, while 98 per cent had a definite preference. Permanence of vocational interests proved to be more characteristic of bright than of dull boys, while in the case of girls, the

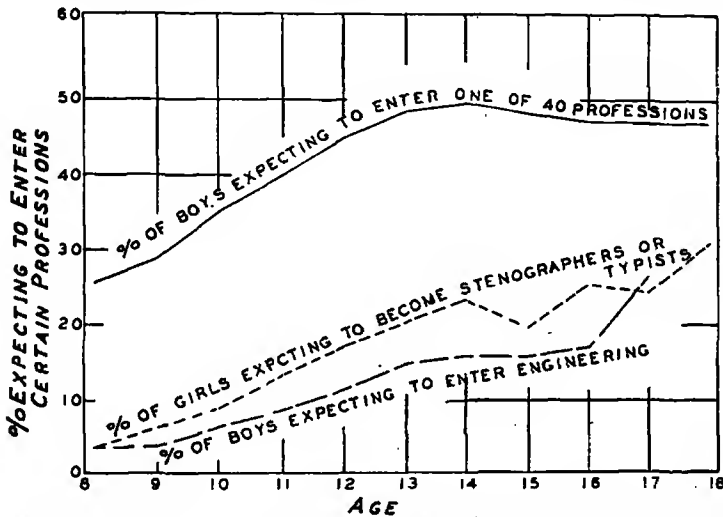


FIG. 57.—Percentage of boys and girls expecting to enter certain occupations according to age. (Based on data of H. C. Lehman and P. A. Witty, *One more study of permanence of interests*. *J. educ. Psychol.*, 1931, 22. From F. K. Shuttleworth, *The adolescent period*. *Monogr. Soc. Res. Child Developm.*, 1938, 3, No. 3.)

reverse was true. The older students in the senior high schools and colleges showed greater permanence of interest than did the younger students in the junior high schools.

What plans the adolescent has for his future vocation, and how long he holds one interest, has been made a subject of study by Lehman and Witty (1931) in the case of 25,000 children. They found that by the time children reach the third or fourth grade, they have definite attitudes towards certain vocations. With the onset of pubescence, there is a marked change taking place in their vocational attitudes. In the following tables are shown the percentages of children at each age, together with the occupations they say they want to follow. These tables were constructed to show what will be the probable number, in a group starting at the age of $10\frac{1}{2}$ years, stating that they will make it so at later ages.

TABLE LIII.—VOCATIONS TOWARD WHICH GIRLS MANIFEST A CHANGE IN ATTITUDE THAT PARALLELS RATHER CLOSELY THE ONSET OF PUBESCENCE

Vocation	Ages							
	10½	11½	12½	13½	14½	15½	16½	17½
	Percentages							
Magician.....	100	72	45	32	26	7	8	1
Circus performer.....	100	80	56	47	32	18	11	6
Jeweler or watchmaker.....	100	72	44	34	24	17	20	19
Maid or servant.....	100	74	49	42	22	19	21	13
Movie actress or actor*.....	100	72	57	43	32	18	15	10
Movie actress or actor†.....	100	63	39	22	15	7	6	1
Teacher in grades or rural schools‡.....	100	77	53	37	26	17	11	6
Nurse§.....	100	72	61	48	31	15	13	8

* Activities which the girls state that they *would like best to follow*.

† Activities which the girls say they *most likely will follow*.

‡ Activities which the girls believe to be the *best money-makers*.

§ Activities which the girls believe are *most respected*.

Source: LEHMAN, H. C., and WITTY, P. A. A study of vocational attitudes in relation to pubescence. *Amer. J. Psychol.*, 1931, 43, 97.

In a later study of the permanence of interest in vocations, Lehman and Witty (1931a) covered 200 occupations selected by several thousand children ranging in age from 8½ years to 18½ years. They found that between 11½ and 18½ years, being an aviator was a boy's first choice; being a cowboy was a favorite choice between the ages of 8½ and 11½ years, with gain in popularity for a legal career occurring in the latter part of adolescence. In girls, the occupation of a stenographer or typist proved to be the most popular at the 18½-year level. In general, this study showed that vocational interests are symptomatic of ability only to a limited degree. Hurlock and Jansing (1934) gave vocational-preference questionnaires to students, fourteen to sixteen years old, and found that engineering was the first choice for boys, while teaching was the first choice for girls. The reason for the choice most often given was "like it." The second reason given for boys was "money" and for girls, "fitted for it."

A definite relationship between intelligence and vocational choice in adolescence has been found to exist. Hollingworth (1928) reported that adolescents of a superior ability are interested in finding work they can enjoy. Terman (1925), in a study of prehigh-school students of average and superior intelligence, discovered that the gifted showed a greater preference for public service, professions, artistic, and semiprofessional careers. Those of average intelligence showed a preference for mechan-

TABLE LIV.—VOCATIONS TOWARDS WHICH BOYS MANIFEST A CHANGE IN ATTITUDE THAT PARALLELS RATHER CLOSELY THE ONSET OF PUBESCENCE

Vocation	Ages						
	11½	12½	13½	14½	15½	16½	17½
	Percentages						
Ship builder.....	100	75	55	40	38	32	25
Soldier.....	100	80	57	34	22	19	14
Sailor.....	100	85	71	50	36	30	20
Circus performer.....	100	75	50	25	14	12	12
Brakeman or conductor on a train.....	100	70	68	49	32	30	23
Switchman or yardman.....	100	68	57	35	27	16	10
Fireman (answering fire alarms).....	100	74	46	33	26	14	9
Motorman.....	100	63	47	23	19	8	13
Cowboy.....	100	75	63	43	21	20	9
Sheepherder.....	100	65	52	29	13	9	6
Night watchman.....	100	58	37	20	13	16	9
Sheriff or policeman.....	100	70	47	32	17	13	10
Worker in railroad shops.....	100	75	59	37	40	28	25
Glass blower.....	100	68	36	37	16	11	14
Jeweler or watchmaker.....	100	82	70	47	27	21	23
Drayman, teamster, or truck driver.....	100	57	41	41	23	21	18
Messenger.....	100	66	50	34	21	11	
Cowboy*.....	100	66	41	21	10	6	
Cowboy†.....	100	68	23	13	11		
Cowboy‡.....	100	74	41	37	14		

* Activities which the boys say they *would like best* to follow.

† Activities which the boys say they *most likely will* follow.

‡ Activities which the boys believe are *most respected*.

Source: LEHMAN, H. C., and WITTY, P. A. A study of vocational attitudes in relation to pubescence, *Amer. J. Psychol.*, 1931, 43, 97.

ical, transportation, athletic, and clerical work. Poull (1922), on the other hand, found that interest rather than intelligence dominated the choice of a career in the girls and boys she studied. There was a wide range of intellectual levels in any occupation examined.

8. DAYDREAMS

Daydreams are a form of self-expression because they fulfill repressed or unconscious wishes not fulfilled in the everyday life of the child. They result from some deficiency in the child's environment and serve as a compensation for what is missing. The dreamer is invariably the central figure of the daydream and derives pleasure from being important. Whether the dreamer be a "conquering hero" or a "suffering hero," who sees himself first as a martyr and then a hero, makes little difference.

In either case, he is the central figure and this gives him pronounced satisfaction.

Theme of Daydreams.—Green (1923), from the analysis of the accounts of hundreds of daydreams of children in elementary and secondary schools, came to the conclusion that, while daydreams differed in material details, the main theme of the daydream is the successful display of the dreamer before an applauding audience. He classified daydreams into four major groups, in each of which the dreamer plays the role of a conquering hero. His classification is as follows:

1. *The fantasy of display* in which the dreamer, in a capacity at variance with the facts of real life, performs a feat for which he is applauded.
2. *The saving fantasy* in which the dreamer saves the life of another by an act of which he is, in reality, incapable and gains the devotion of the rescued person, generally a member of the opposite sex.
3. *The fantasy of grandeur* in which the dreamer occupies an exalted role, such as that of a royal person or a deity.
4. *The fantasy of homage* in which the dreamer gains the love of an admired person, usually a superior, by doing a service for that person.

Daydreams of Childhood.—Daydreaming begins early in childhood, around the third year, and becomes an increasingly pleasant form of self-expression with each succeeding year. It reaches its peak early in adolescence and, under normal conditions, begins to decline after that. During the childhood years, marked age differences appear in the form and content of the daydream. At first, the daydream is influenced by fairy tales, Bühler (1930) found, and later by adventure stories of the Robinson Crusoe type. The reading interests of the child are responsible to a large extent for the characters, setting, and actions of the daydream. When children's readings deal with realistic situations, as is true around the ninth or tenth year, the daydream in turn becomes more realistic.

Smith (1904) found that the typical daydreams of early childhood centered around play, playmates, food usually denied children, as ice cream and candy, and being rich enough to have every desire gratified. From seven to eight years, the dreams are almost entirely of play and good times, with a sprinkling of the fairy-story type of dream. In girls from eight to ten years, nearly all were found to dream of themselves in a fairy-tale world, as a princess living in a palace with unlimited amounts of clothing and jewels. Dreams of this type are less common in boys. Their dreams show their desire for riches, mostly in the form of finding money, discovering gold mines, or inheriting money from newly discovered relatives. From then until adolescence, sports, athletics, travel, and adventure are the main themes of the daydreams of both boys and girls. Jersild, Markey, and Jersild (1933) studied the daydreams of children, five to twelve years of age, by the interview method. Each

TABLE LV.—PERCENTAGE DISTRIBUTION OF CONTENT OF CHILDREN'S REPORTS WHEN QUESTIONED ABOUT DAYDREAMS

Type of daydream	All children	Age groups, years				Sex groups	
		5 to 6	7 to 8	9 to 10	11 to 12	Boys	Girls
I. Getting, having toys, food, clothes, pcts, etc.....	7.8	8.9	6.3	11.4	5.2	10.6	4.9
II. Getting, having money, being rich.....	4.1	1.5	2.3	5.7	6.2	5.4	2.7
III. Improvement in home circumstances...	0.9	1.5	1.7	0.6	0.0	0.3	1.5
IV. Amusements, parties, diversions, make-believe play.....	19.2	28.1	20.0	17.7	13.4	18.6	19.8
V. Travel.....	2.2	0.0	3.4	1.1	3.6	2.6	1.8
VI. Having a father, brother, etc.....	0.9	0.7	1.1	0.0	1.6	0.3	1.5
VII. Imagined achievements and accomplishments.....	1.7	0.0	1.1	2.3	2.6	2.3	0.6
VIII. Having a profession, being big, independent.....	6.2	3.0	5.1	4.0	11.3	6.0	6.4
IX. Moral self-improvement.....	0.3	0.7	0.0	0.6	0.0	0.0	0.6
X. Personal appearance.....	0.2	0.0	0.0	0.0	0.5	0.0	0.3
XI. Prestige and adventure.....	7.1	3.0	5.1	7.4	11.3	8.0	6.1
XII. Identification of self with hero or heroine.....	1.9	0.0	1.7	4.0	1.6	1.7	2.1
XIII. Magical powers and feats.....	1.6	1.5	3.4	1.1	0.5	0.9	2.4
XIV. Parenthood.....	1.2	0.7	1.7	0.6	1.6	0.3	2.1
XV. Love and marriage.....	0.4	0.0	0.0	0.6	1.0	0.3	0.6
XVI. Relief from duties and unpleasantness...	1.2	0.7	0.6	1.7	1.6	0.6	1.8
XVII. Benefits for relatives; philanthropic ventures.....	1.8	0.7	2.9	0.6	2.6	0.6	3.0
XVIII. Heaven and after life.....	0.4	0.7	0.0	0.6	0.5	0.6	0.3
XIX. About movies seen.....	2.8	1.5	3.4	2.9	3.1	3.7	1.8
XX. About stories heard and read.....	4.3	8.9	4.6	2.3	2.6	3.1	5.5
XXI. Make up stories and poems.....	1.6	1.5	2.3	1.1	1.6	2.0	1.2
XXII. Supernatural situations (apparently not unpleasant).....	1.0	0.7	1.1	0.6	1.6	0.9	1.2
XXIII. Make-believe episodes of everyday life...	2.9	4.5	3.4	1.1	2.6	1.4	4.3
XXIV. Thoughts about commonplace events, past happenings.....	11.1	10.4	6.9	13.7	12.9	11.4	10.6
XXV. Failure in school.....	1.0	0.0	1.1	1.7	1.0	0.9	1.2
XXVI. About being alone, ghosts, robbers, mystery, etc.....	3.5	3.7	5.1	4.0	1.6	4.0	3.0
XXVII. Imagined accidents.....	1.8	2.2	2.9	1.7	0.5	2.0	1.5
XXVIII. Imagined injury or death of parents and others.....	1.5	2.2	1.1	1.1	1.6	1.1	1.8
XXIX. Imagined deprivation, impoverishment.....	0.6	0.7	0.6	0.6	0.5	0.6	0.6
XXX. Autistic, auditory and visual images...	1.2	0.0	1.7	1.7	1.0	0.6	1.8
XXXI. No response, don't have any, unintelligible.....	8.0	11.9	9.1	7.4	4.6	9.4	6.4
Number of children questioned.....	399	99	100	100	100	199	200
Number of items reported.....	679	135	175	175	194	350	329

Source: JERSILD, A. T., MARKEY, F. V., and JERSILD, C. L. Children's fears, dreams, wishes, daydreams, likes, dislikes, pleasant and unpleasant memories. *Child Develop. Monogr.*, 1933, No. 12, 98-99.

child was asked to tell the interviewer what he daydreamed about, and the theme of the daydream was then recorded. In Table LV is given the percentage distribution of the content of the daydreams as reported by the children.

Commenting on the results obtained, Jersild, Markey, and Jersild pointed out that the central theme of a large number of the daydreams is amusement, play, or activity of some kind, in which mention is made of some form of self-glorification. Many daydreams deal with material possessions in the form of toys, clothes, food, money, and improved living conditions. Older children had many more daydreams in which they played an heroic role or in which they occupied an improved or superior status than had the younger children. The daydreams of younger children dealt more with diversions and amusements. For the most part, the daydreams of boys and girls resembled each other quite closely.

Daydreams in Preadolescence.—Daydreaming is proverbially an adolescent trait, but perhaps at no other time is it engaged in so much or in so dangerous a form as during the preadolescent months. At this time, it serves as a retreat from unpleasant reality; it helps to occupy the hours that are spent in isolation; and it gives the daydreamer an opportunity to indulge in self-pity and self-sympathy.

The typical daydreams of this age are of the suffering-hero type in which the preadolescent sees himself first as a martyr in the hands of parents, teachers, or friends. At the end of the daydream, he turns out to be a hero and derives great pleasure from both experiences. Daydreaming of this sort gives the preadolescent an opportunity to pity himself and intensifies an antagonistic attitude toward society which already exists. This results in his believing that the world is against him.

The "foster-child" daydream is a common form of the suffering-hero daydream occurring in the preadolescent years. Conklin (1920) reports that nearly all children at some time or other believe that they are the children of other parents, usually of higher social and economic status than the parents with whom they live. To discover how prevalent and how strong the foster-child daydream is, Conklin made a questionnaire study, using high-school students in their junior and senior years and college students from the freshman and sophomore classes. He found that 28 per cent of the 904 students answering the questionnaires could recall having experienced this type of daydream, though it was slightly more common among girls than among boys. Over half of the students reported that the daydream never took any definite form, while 18 per cent of them believed they were children of great parentage, 15 per cent believed they were orphans or foundlings, and a few believed they were strange, mysterious, or supernatural beings.

Daydreams in Adolescence.—The peak of daydreaming comes during the adolescent years. Daydreams at this age serve as an escape from conflicts in the environment or as a means of satisfying love and ambition, neither of which has been obtained satisfactorily in the life of the adolescent. If the daydream serves as a trial-and-error process of discovering what he wants to do, the daydream of the adolescent is good. If, however, it is merely an escape from unpleasant reality, it is bad in that it makes adjustment to real life situations even more difficult than they are.

Smith's (1904) study of the daydreams of high-school and normal-school students revealed some interesting facts about daydreaming during the adolescent years. The conditions most favorable to daydreaming proved to be twilight, moonlight, solitude, soft music, falling water, or any other monotonous sounds, listening to an uninteresting sermon or lecture, watching an open fire, or a state of physical or mental fatigue. From the age of twelve years, the influence of books on the content of the daydream becomes increasingly important. Girls put themselves in the place of their favorite heroines and adapted the material of the romances in the book to their own life situations. Boys, on the other hand, who prefer adventure stories, identify themselves with the heroes of these adventures and derive much pleasure from imagining themselves as conquering heroes.

In the less imaginative individual, the daydream is to a large extent a literal reproduction of the books read, with only minor changes to enable the dreamer to fit himself or herself into the situation. For the more imaginative adolescent books serve merely as the raw material from which the daydream will be constructed by the dreamer. In both cases, the pleasure of the daydream is enhanced by the atmosphere of the story-book world.

Evaluation of Daydreaming.—No matter how much enjoyment the adolescent derives from his daydreams, daydreaming is an unhealthy form of self-expression. Aside from the fact that daydreaming wastes much valuable time which the child or the adolescent cannot afford to waste, its most serious drawback lies in the fact that daydreaming gives the individual a distorted concept of himself, whether it be in the form of a delusion of grandeur or a delusion of persecution. Because of this distorted concept, adjustments to members of the social group are increasingly difficult to make. If daydreaming is far more enjoyable to the adolescent than what real life has to offer, he withdraws more and more into the daydream world.

9. CREATIVE FERVOR

The desire to create, or to make something, is present from early babyhood. It is one of the most desirable outlets for self-expression in

childhood in that it gives the child satisfaction while at the same time proving to be a socially acceptable form of behavior.

1. Drawing.—One of the most frequently used outlets for the creative fervor is drawing. Owing to poor muscle coordination, the young child cannot actually draw, but he takes keen delight in scribbling in which he makes crude and often totally aimless movements with pencil or crayon. To him, drawing is a means of expression rather than a means of creating beauty. The finished product is far less important than the creation of it.

Drawing is an expression of what is uppermost in the child's mind at the moment. His first drawings are symbolic and are not direct copies of objects. The child draws things as he remembers them, but he is not interested in perspective, proportions, or relationships. He puts in details that interest him, such as buttons on a coat, while at the same time omitting essentials, such as a man's body or the engine of an automobile.

Later, as the child becomes more mature, he outlines or sketches objects partly from memory and partly from direct observation of them. From about the sixth year, the child tries to reproduce in his drawings what he sees and begins to show regard for size, perspective, and correctness of detail. Throughout the early years of childhood, the child shows more interest in color than in form and prefers crayons or paints to the use of pencil.

Stages in Drawing Ability.—Experimental studies of children's drawings have shown that the ability to draw follows a more or less definite pattern of development. In a study of preschool children, Gesell (1940) noted the following pattern in drawing ability:

- At 12 months. Marks by banging or brushing.
- At 18 months. Scribbles but marks off page.
- At 2 years. Scribbles, but better defined than at 18 mo. and rarely goes off paper.
- At 3 years. Names drawings but hard to see object named.
- At 4 years. Rarely scribbles. Rather, drawing takes on form and meaning.
- At 5 years. Drawing clearly recognizable for what child names it to be. Differentiates parts.
- At 6 years. Drawings show improvement in precision and detail over those of five-year-old.

Waddle (1918) has listed four stages in the development of drawing. (1) The first is the "scribble stage," from two to five years, when the child's drawing is random and later suggests an object, to which the child attaches a name. (2) The "artistic illusion stage," from five to twelve years, is a noncritical and imaginative stage in which the child can depict what is in his mind, even though his drawing is symbolic rather than pictorial, with little attention to symmetry and proportions, but with much attention to decorative details, as buttons and hats. (3) In the

third, or "self-conscious stage," which begins around the age of twelve years, the child comes under the influence of a teacher or someone who makes the child self-conscious about his work. This leads to discouragement and loss of interest which, in turn, causes many children to give up drawing. (4) The final stage recognized by Waddle, the "rebirth of artistic ability" occurs from the fifteenth or sixteenth year and only in the case of a few individuals. At this time, drawing is an artistic achievement, in which the adolescent for the first time is interested in the artistic value of his product.

Subjects of Children's Drawings.—Studies of the drawings of young children led Gesell (1928) to conclude that, when they draw spontaneously, it is unusual for them to draw anything bizarre or eccentric. When McCarty (1924) asked over 30,000 kindergarten, and first- and second-grade children to draw anything they wished, the most popular object proved to be the human form, which occurred in 16.5 per cent of the drawings, with the adult form slightly more popular than the child's form. Next in order of popularity were houses, 13.9 per cent, trees, 9.3 per cent, and furniture, 8.3 per cent. Animals appeared in only 4.0 per cent of the drawings and design in 0.5 per cent. With increase in age, McCarty found a decrease in drawings of the human form and more interest in drawing buildings and nature in all phases, as animals and flowers. From four or five years on, there was an increase in composition, as compared with the drawing of simple objects, which is characteristic of younger children.

Hurlock and Thomson (1934) asked kindergarten, and first- and second-grade children, ranging in age from $4\frac{1}{2}$ to $8\frac{1}{2}$ years, to draw pictures of eight objects, as a man, tree, girl, house, dog, flower, automobile, and boat. They were allowed to use either crayons or pencils. In all, 2,292 drawings were made. Color was always used. The younger children said they like it, while older children used it because they thought it was appropriate. There was no interest in formal design; this rarely appears until the tenth or twelfth year. There was an increase in the use of background, such as waves surrounding the boat and trees around the house, as well as an increase in number and accuracy of details, with increase in age (refer to Fig. 48, page 286).

Knauber (1931) found that as early as two years of age, there was a great difference in children's interest and ability in drawing. In the case of nursery-school children, anything new and interesting, without regard for pattern, interested them most, while in the kindergarten, and first, second, and third grades, the children preferred to draw things for which they had learned patterns. They showed a preference for their natural surroundings, people, trees, houses, or flowers, or for those subjects which they had learned by imitation. As children grow older, the subject of

their drawing is influenced to a large extent by their environment and recent happenings. This results in marked individual differences in what different children draw. Figure 58 shows the typical drawings of an adolescent.



FIG. 58. -Spontaneous drawing as a form of self-expression during adolescence.

Effect of Criticism.—Young children enjoy drawing as a form of self-expression. They will cover pages of paper with drawings and will show pride in their achievement. They call adults to come and look at their drawings and are greatly pleased when the adult makes favorable comments. Sooner or later, the child's drawings are criticized or made fun of by others. From the age of ten or twelve years, as a result of this, the child becomes self-conscious about his drawings. This is accentuated by an already existing attitude of self-consciousness and by formal teaching in art classes in school.

2. Crayoning and Painting.—Creative activities involving the use of crayons and paint are popular during childhood and follow much the same pattern of development as drawing. At two years of age, Gesell (1940) found that experimentation was largely motor and manipulative; by three, the child can control the use of artistic media; at four, imagination enters into the child's activities; and by five, he begins to be self-conscious about his work. The following pattern of development in crayoning has been noted by Gesell (1928):

THE GENETIC SEQUENCE OF CRAYON AND PAPER BEHAVIOR
[Gesell (1928)]

0 to 1 month	Reflex clasp of crayon without visual regard.
1 to 3 months	Increasing complexity in manipulation reactions to crayon, without visual regard.
3 to 5 months	Increasing visual cooperation in manipulation of crayon and paper. Clasps (with two hands) paper favorably presented. Picks up crayon on contact with hand.
6 to 9 months	Reaches for crayon on sight. Brandishes, bangs, and crumples. Does not bring paper and crayon into exploitive relation. Hand to mouth reaction frequently dominates.
9 to 12 months	Gradually brings crayon and paper into productive relation. Makes staccato banging marks; or faint wavering scrawl. Gives fugitive heed to demonstration of scribbling by examiner.
12 to 18 months	Imitative scribble. Transient, fitful exploitation by crayon, with fugitive attention to marks produced. Increase of controlled innervation in bringing crayon to bear upon paper.
18 to 21 months	More defined and spontaneous scribble. Makes a crude imitative stroke. Differentiates between a straight stroke and a circular stroke.
24 to 30 months	Imitates a vertical stroke. Shows prolongation of attention span in crayon activity.
30 to 36 months	Makes two or more marks in imitation of a square cross, but does not make adaptive combination of strokes.
36 to 40 months	Imitates a horizontal stroke. Brings vertical and horizontal strokes into relation in imitation of a cross. Copies a circle from a model.
48 to 60 months	Copies a cross. Copies a square. Draws a recognizable man. Begins to differentiate between square and oblique cross drawn from model.

The use of water-color paints follows shortly after the child uses crayons and is an equally popular form of self-expression. The young child derives keen enjoyment from covering pages of paper with bright colors, selected and combined by him without adult supervision or interference. "Finger-painting," a glorified form of mud-pie play in which the paints are the consistency of mud and are put on the paper with the finger or hand, has recently become popular in childhood. Because the child derives so much enjoyment from this type of activity, and because

it is such a healthy form of self-expression, nursery schools and kindergartens offer children ample opportunity to engage in creative work of this type.

3. Music.—Regardless of whether or not they have musical talent, little children like to sing. The baby first engages in this form of self-expression when he introduces rhythm into his babbling. It gives him keen enjoyment to listen to the singing of his babbling, and he laughs heartily at himself. By the age of four or five years, most children can sing simple melodies, can beat good rhythm, and can recognize simple tunes. Even though the child does not know all the words of a song, he will supplement with words of his own.

Producing music, whether by striking keys of a musical instrument, winding a music box, or turning on a victrola or radio, is very popular with young children. While they enjoy listening to music produced by others, the enjoyment that they derive from their own music, even though it be of a vastly inferior caliber, is far greater. They enjoy rhythms and dancing, which is often little more than walking to music. Because music in all forms in which the child may take part is such a pleasing, as well as wholesome, form of self-expression, it is strongly encouraged by parents, nursery schools, and kindergartens.

Singing is the most frequently used form of musical expression, because it does not require technical training to use it, as is true of the playing of all forms of musical instruments. The types of songs children like has been studied by the Boyntons (1938), in the case of nearly 9,000 boys and girls, of grades one to six. At every age, the songs they like depend upon their major interests at the time. In the table on page 417, are given the percentages of songs liked at different ages by both boys and girls.

The percentages given in this table show that school songs are the most popular in the first four grades. Interest in this type of song begins to decline in the fourth grade and drops consistently after that. As the child grows older, there is an increased interest in classical, folk, and patriotic songs. There is less interest also in religious and holiday songs with age, and increased interest in popular and dance music.

Study of specific songs preferred in these classifications showed that children prefer songs of easily perceived tonal values and slow cadence. This is because they are "singable" and can thus be enjoyed by all, whether or not they have musical ability. Also, they can be learned without too much effort and are thus not regarded as part of a singing lesson. Slow singing was found to be popular because it is relaxing and restful.

Unfortunately, like drawing, music as a form of self-expression is too often abandoned late in childhood. The critical attitude of music

TABLE LVI.—TYPES OF SONGS PREFERRED BY 4,473 BOYS AND 4,423 GIRLS OF DESIGNATED GRADE PLACEMENT

Type of music	Sex	Grade					
		1	2	3	4	5	6
School songs	Boy.....	55	57	46	33	18	14
	Girl.....	56	56	47	31	24	15
Classical	Boy.....	..	*	*	1	2	2
	Girl.....	*	*	*	1	3	3
Dance—jazz	Boy.....	*	1	2	3	2	5
	Girl.....	*	1	3	6	6	5
Folk songs	Boy.....	4	5	6	10	16	15
	Girl.....	3	3	4	7	9	10
Holiday songs	Boy.....	6	4	4	2	2	1
	Girl.....	7	6	4	3	2	1
Mountain ballads	Boy.....	1	2	3	5	8	7
	Girl.....	*	1	2	4	4	1
Nursery rhyme songs	Boy.....	5	2	1	*	*	
	Girl.....	5	2	1	1	*	
Negro spirituals	Boy.....	*	*	*	1	1	1
	Girl.....	*	*	*	1	*	
Patriotic	Boy.....	7	10	12	18	13	17
	Girl.....	7	8	11	12	12	14
Popular—not jazz	Boy.....	8	9	13	13	18	26
	Girl.....	8	10	14	20	26	37
Religious	Boy.....	13	9	11	9	5	6
	Girl.....	12	12	13	11	8	8
Semiclassical	Boy.....	*	1	2	4	9	7
	Girl.....	*	*	2	3	7	6

* Mentioned but with a frequency of less than 1 per cent.

Source: BOYNTON, P. L., and BOYNTON, J. C. *Psychology of child development*. Minneapolis: Educational Publishers, 1938, p. 301. Quoted by permission.

teachers causes the child to become self-conscious about his ability. Even his playmates sometimes make fun of his attempts to sing, with the result that the child limits the use of this form of self-expression to times and places where he can feel safe from criticism or ridicule. The fact that

most adults enjoy active participation in singing or playing musical instruments, when they are alone or in a crowd where they believe they can participate without calling attention to themselves, shows that this form of self-expression is rarely abandoned but is modified to meet social requirements.

4. Writing.—Creative fervor, in the form of writing stories or poetry is very commonly found in adolescence. Back of the desire to write is the desire for self-expression and attention, which at earlier ages took the form of drawing or music. Many adolescents with very mediocre ability crave literary careers because they like the idea of the popular acclaim that accompanies such careers. The diary offers the adolescent an outlet for self-expression. In it, he can give vent to pent-up feelings and emotions which are not given a satisfactory outlet in everyday life.

Writing poetry, as a form of play, has been investigated by Lehman and Witty (1928b). Only slight sex differences, in favor of the girls, existed, while striking differences between Negro and white children occurred. Negro children were found to write poems much more frequently than white children, and this ratio difference was obtained for all age levels. With increase in age, during adolescence, boys and girls of both races show less interest in writing poetry than was found to exist among younger adolescents.

10. REFORMING OTHERS

Reform of Parents.—The cocksure, self-assertive adolescent turns his attention to reforming others whom he disapproves of for one reason or another. His parents, brothers, sisters, and home come in for the first attacks. Mother's hair is "frumpy," father is careless about his speech, the younger brothers and sisters are rowdy, crude, and boorish, while older brothers and sisters are criticized because they are too selfish and self-centered.

Criticism of parents is a forerunner of attempts at reform on the part of adolescents. They find fault with their parents before they engage actively in trying to reform them. Stott (1940) asked adolescent boys and girls from farm, small-town, and city environments what their parents did that they did not like. He found that 35.9 per cent of the adolescents studied criticized the mother and 36.2 per cent, the father. Girls criticized both parents more frequently than did boys; small-town adolescents more than those who came from farms; and city adolescents least of all. The specific items of parental behavior most often criticized were the personal habits and matters of personal conduct of the parents, in both of which fathers were criticized three times as frequently as mothers. Mothers were very often criticized for a tendency to overwork and to sacrifice themselves.

Criticism of Home.—The home itself, with its furnishings, comes in for its share of criticism. According to the reformer, color combinations are not right, the curtains are out of style, the lights are of the wrong type, and the furniture is cheap, old-fashioned, or ugly. Girls are especially sensitive about their home backgrounds and often declare that they do not want to invite their friends to their homes on such flimsy pretenses as lack of interest in parties or that it makes too much trouble.

Reform Outside of the Home.—Everything that forms a part of the adolescent's life comes in for its share of reform. The school, college, friends, lovers, and even the community at large are not spared. The school or college curriculum are open to fire, and the teaching, administration, and self-government rules, all can be improved upon, the adolescent believes. The adolescent's most intimate friends are not spared in this zeal for reform. The girl attempts to improve the appearance, manners, and speech of her friends, just as the adolescent boy ridicules his friends until they change and conform to his pattern.

Religious Reform.—In the field of religion, the adolescent is sometimes a very aggressive reformer. After deciding upon a religion for himself, he tries to convert his friends and associates. If he has discarded all religious faiths and declared himself an atheist, he tries to convert his friends to his point of view by criticizing and ridiculing them for their blind faith. This desire to convert others is motivated partly by the adolescent's zeal for reform and partly by the adolescent's confidence; because he believes so firmly in his own point of view, he wants to share it with others, thus helping them to avoid the mental and emotional distress that he experienced during a period of religious doubt.

Arguments.—Disagreeing with adults, whether parents or teachers, and arguing about matters of political, social, or economic consequences are common in adolescence and are usually accompanied by a frank and open statement by the adolescent in regard to what he thinks should be done to improve existing conditions. The old and tried ways of the conservatives, the adolescent believes, should be discarded in favor of new, untried, and revolutionary schemes of the radicals. While this rarely ever leads to more than arguing and disagreeing, it is nevertheless an outgrowth of the adolescent's desire to reform, which gives him tremendous satisfaction because of the belief that his point of view is superior to that of those with whom he disagrees.

11. CLOTHING

Children's Attitudes toward Clothing.—Very early in life, the child discovers that his clothes attract attention to himself. Comments are made by adults about the newness, the color, or the style of the clothing. Playmates of his own age notice and admire his new clothes and

openly envy an article of clothing which they themselves do not possess. Murphy (1937) reported that three-year-olds not only noticed one another's clothes but referred to the newness, color, or any feature that was different in the clothing of other children. It is not therefore surprising that the little child learns the powerful effect that clothing has on others and the gratification that it gives to the wearer. As a result, his interest in clothing is greatly enhanced.

Scientific studies of the child's interest in clothing by Flaccus (1906), Hurlock (1929, 1929a), Macaulay (1929), and Sanborn (1927) have shown just what clothing really means to a child. New clothes, which many adults dread, have a peculiar charm for the child, who wishes to wear a new garment as soon as it is bought, whether or not it is appropriate for the occasion. The child is ridiculously proud of a new garment and calls attention to it with such remarks as: "See my new shoes!" The garment that is noticed and admired by others becomes especially dear to the child, but it loses its charm if it is ignored. The first clothes of a particular kind, especially if they are like the clothes of older children, are worn with tremendous pride. The first pocket, the first long trousers, the first kid gloves, or the first long stockings are the source of much pleasure.

Slavish conventionality in regard to clothing comes when children reach the self-conscious age, beginning around the eighth or tenth year. At this time, boys and girls want to be noticed as little as possible, and if they are like others in appearance, there is less chance for them to be singled out and made conspicuous. If the child is forced to wear clothes different from those of his friends, he feels ashamed and is afraid to go out, for fear of being laughed at. This attitude becomes increasingly pronounced with each successive year until the end of early adolescence, at approximately the sixteenth year. After that, with regaining of self-confidence and a definite desire to be noticed, the adolescent swings to the opposite extreme in his attitude toward his clothing.

Macaulay's Study.—In order to discover what is the child's attitude toward clothing, Macaulay (1929) asked boys and girls, six to fifteen years old, from moderately prosperous homes in Exeter, England, to write short essays in answer to the following questions:

1. What sort of clothes do you like best to wear to a party? Say why you like them.
2. What sort of clothes do you like best to wear for everyday? Say why you like them.
3. Are there any clothes that you dislike, and would do without if you could? Say why you dislike them.

Their answers revealed that, up to the age of nine years, children regard clothing simply as a form of decoration, and the design of the

clothing is unimportant. There is a strong interest in color, but the child's attitude toward color changes with age. Girls seven to nine years old choose a single bright color, such as blue, pink, red, or yellow. Even boys at this age like colors. As children grow older, there is a decrease in their desire for brilliantly colored garments and an appreciation for a greater range of colors. In the case of girls from twelve years of age on, Macaulay reported that many mentioned that the colors of the garments must be "pale" or "light," and some of the girls even selected gray, brown, or black for the first time. At this age, they want combinations of colors or patterned materials for their clothes.

Up to the age of nine years, color proved to be the only important factor in the child's choice of garments. After that age, children regard the design of the garment as an important consideration in their choice. They show definite preferences for certain types of clothing, whether or not the design is suitable to their ages or personalities. Little attention is given to the edicts of fashion, while major emphasis is placed on the decoration of the garment. From the age of twelve years, children consider both fashion and the suitability of the clothing as important. Boys, at that age, become more conventional in their attitudes toward their clothes than they formerly were. Throughout childhood, clothing is regarded as an impediment. Children want freedom of movement, and they dislike any clothing that hampers them. They show a dislike for tight, rough, or heavy clothing, and they prefer dark colors in their clothes, so that the dirt will not show.

Adolescent Attitudes toward Clothing.—The adolescent's attitude toward clothing differs from that of the child in four very important ways. (1) The adolescent is keenly interested in the style in vogue at the moment and wants to adopt it, regardless of whether or not it is becoming to him. (2) The adolescent is aware of the appropriateness of different types of clothing and wants to wear the right type of clothes for the occasion. (3) The third is an outstanding difference between the child's and the adolescent's attitude toward clothing lies in the interest shown in right color combinations. (4) The adolescent tries to keep his clothing in good condition, which contrasts markedly with the child, who has little interest in how his clothes look and takes delight in appearing dirty and slovenly.

The adolescent usually wants the latest and most extreme styles in clothing. The love of personal adornment, which is so strong among primitive peoples, appears in its full intensity at this age, and the civilized adolescent will go to any length to adorn himself, partly because of the satisfaction it gives him and partly because of the attention it attracts to himself. As a result of the admiration of the opposite sex as well as of his own sex, the adolescent regains the self-confidence temporarily lost at the onset of puberty and derives keen pleasure from being conspicuous.

Because the face and hair are generally the first focal points of attention, adolescent boys and girls spend unjustified amounts of time and effort in an attempt to beautify their faces and to dress their hair in the latest and most becoming styles. The use of cosmetics is a sign of growing up for the adolescent girl. Nails, complexions, feet, and hands, all come in for beauty aids because the adolescent realizes that they, like the head, are focal points of attention and, for that reason, wants them to be as pleasing as possible.

Perhaps at no age is the desire to select one's clothes quite so pronounced as during adolescence. Even though his choice may not be as becoming or as suitable as that of his parents, the adolescent feels that clothing expresses his personality, and for that reason, he wants to wear what he thinks is his type. The adolescent girl is especially "personality conscious" and views all clothes from the point of view of whether or not they are her type. Because the adolescent is keenly interested in style, the choice of clothing is apt to be, for the most part, appropriate and satisfactory. Occasionally, of course, the adolescent will select a garment that is not becoming or appropriate, but he soon recognizes this and tries to avoid a similar mistake in the future.

Influence of Clothing.—Clothing is one of the most satisfactory forms of self-expression that the child can have. His clothes are not only the source of much pleasure to him, but they add tremendously to his attitude of self-confidence. A well-dressed child is more self-confident, better-mannered, and less rowdy than a poorly dressed one. In addition to that, it is a form of self-expression that becomes increasingly important as time goes on. The adult finds that clothing has a marked effect on his behavior and that it has a definite influence on his outlook toward life.

In evaluating clothing as a form of self-assertion, the second criterion of its value, the attitude of the social group, must also be taken into consideration. There is no question about the fact that the social group as a whole judges the individual in relation to his clothing and that it regards the latter as an outward insigne of the inward man. It applauds those whose clothing wins the approval of the group and condemns those whose clothing does not conform to social standards.

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INDEX

A

- Abdominal reflexes, 61
- Abnormalities, causes of, 69
- Abt, I., 154, 423
- Accent, babyish, 176
- Accuracy of movement, 148-149
- "Adam's apple," 121
- Adenoids, 216
- Adipose tissue, 115
- Adler, A., 154, 423
- Adolescence, 25, 44, 104, 111, 117-118, 148, 171, 176-177, 182, 195, 207, 213, 239, 242, 311, 326, 328, 340, 343, 350, 353, 355, 361, 371, 375, 388, 390-392, 394, 397, 418
 - awkwardness during, 115, 149-150
 - in boy, 121, 183
 - changes during, 233
 - collections during, 268
 - companions in, 248
 - early, 44, 150, 248, 354
 - in girl, 121, 183
 - late, 44, 150, 238, 249, 357
 - leaders during, 252
 - religious attitude during, 350
 - romances during, 205, 383-384, 400
- Adornment, personal, 380
- Aesthetic perception, 302
 - in adolescence, 304
 - in music, 307
- Affection, 190, 205, 211, 367, 396
 - for adults, 190
 - for children, 190
 - expression of, 213-214, 367-368
 - responses in, 212
 - stimuli to, 212
 - transfer of, 368
- "Affected tone," 177
- Afterbirth, 55
- Age of antagonism, 369
- Age of parents, 73
- Age of viability, 60
- Aggression, attitude toward, 336
- Aggressive behavior, 3, 22, 335
- Agnosticism, period of, 361
- Agnostics, 342
- Aiming, accuracy of, 149
- "Albert," 192-193, 197
- Alcohol, 72
- Alcott, B., 5
- Allin, A., 309, 435
- Allport, F. H., 160, 352
- Ambidextrous, 136
- Ames, L. B., 125, 140, 142-143, 425
- Amnion, 55
- Amusement, 210, 267, 271, 277
- Analytical studies, 125
- Anemia, 123
- Anger, 187, 195, 202, 207, 210-211, 216, 217, 400
 - duration of, 205
 - manifestations of, 204
 - outbursts of, 203
 - reactions during, 202
 - responses in, 203
 - stimuli to, 202-203, 215
- Animism, 288
- Antagonism, sex, 368-370, 372
 - spirit of, 239
- Anxiety, 121-122
- Appreciation, music, 306
- Approval, 195, 236, 335
 - social, 232, 235-236, 328
- Arguments, 419
- Arlitt, A. H., 72, 423
- "Armchair method," 135
- Arms, 110, 141
 - motor development of, 128, 130
- Armstrong, E. M., 135
- Arteries, 117
- "Artistic illusion stage," 412
- "Ascendant behavior," 250
- Asexual, 366
- Assertion, self, 340
- Associations, 302
 - with adults, 303
 - constant, 383

- Associations, pleasant, 302
 unpleasant, 302
- Associative play, 227
- Athletics, competitive, 336
- Attention, 205, 290, 292
 desire for, 397, 399
- Attitudes, 335
 toward clothing, 421
 emotional, 343
 of inferiority, 377
 religious, 346, 349-350, 356
 social, 123, 398
- Authority, adult, 325
 group, 336
- Autobiographical method, 15
- Aversion to opposite sex, 247, 372-373
- "Awkward age," 44
- Awkwardness, 38, 122, 397
 adolescent, 149-150
- B
- "Babble age," 163
- Babbling, 21, 161-163, 399, 416
 sounds, 163
- Babinski reflex, 22, 86
- Baby biographies, 8, 77, 126, 140, 158
- "Baby talk," 157, 159, 161, 178
- Baby teeth, 58
- Babyhood, 43, 104, 123, 152
- Badness, willful, 326
- Balance, 143-145, 152
 of body, 147
- Baldwin, B. T., 294, 423-424
- Barker, M. A., 19, 424
- Barnes, E., 16, 303, 343, 345, 424
- Bartelme, P., 154, 423
- Bartlett, E. R., 322, 424
- Bases of attraction, 379
- Bayley, N., 148, 156, 162, 191-192, 424
- Beard, 120
- Beautiful, perception of, 302
- Beauty, physical, 378, 380
- Beaver, A. P., 225, 424
- Beckman, R. O., 75, 432
- Bed-wetting, 207
- Beeson, M. F., 405, 424
- Behavior, 236, 321
 aggressive, 322
 ascendant, 250
 code of, 329
 emotional, 187, 189, 192, 196
- Behavior, gregarious, 218
 homosexual, 396
 masochistic, 395
 moral, 318, 319
 phases of development, 318
 onlooker, 226
 resistant, 228
 sadistic, 394
 sex, 371
 social, 221, 227, 232-233, 244
 (See also Social behavior)
 unoccupied, 226
- Bellingrath, G. C., 252, 424
- Berliner, A., 304, 424
- Betts, G. H., 346, 352, 354, 425
- Bible, 349-350, 355, 359
- Bicycling, 148
- Bilingual speech, 185
- Binet, A., 9, 16
- Binet-Simon test, 155, 169, 296
- Biographical method, 14-15
- Biographical studies, 125, 290
- Biography of a baby*, 5
- Birth, 344
- Birth cry, 79, 88
 variations in, 88
- Blanchard, P., 335, 425
- Blanton, S., 77, 89, 99, 163, 179-180, 425
- Blatz, W. E., 188-189, 220, 236, 240, 425
- Blindness, 103
- Blinking, reflex, 129
 voluntary, 129
- Block, S., 233, 251, 425
- Block, V. L., 403, 425
- Block building, 257, 263
- Blonsky, P. P., 74, 303, 425
- Blumer, H., 338, 425
- "B. O.," 121
- Boasting, 207, 399
- Body posture in walking, 145
- Body proportions, 152
- Body, size of, 152
- Bones, 59, 111-112, 128
 number and condition of, 111
- Books, 337
- "Bo-peep" game, 210
- Bose, R. G., 353, 425
- Bossard, J. H. S., 380, 425
- Bott, H., 188-189, 220, 225, 236, 240, 266, 425
- Bowden, A. O., 252, 425

Boy Scouts, 234, 251
 Boyd, W., 290, 426
 Boynton, J. C., 416-417, 426
 Boynton, P. L., 281, 416-417, 426
 Brain, 56, 65, 102, 116, 120
 Brainard, P. P., 8, 426
 Brandenburg, G. C., 290, 426
 Breed, F. S., 306, 426
 Brian, C. R., 295, 426
 Bribes, 334
 Bridges, K. M. B., 190, 192, 223, 225,
 258, 265, 426
 Brogan, A. P., 322, 450
 Bronchia, 55
 Bronner, A. F., 336, 338-339, 436
 Brooding, 355
 Brown, M., 252, 426
 Brownstone, C., 171, 426
 Brumbaugh, F., 310-311, 426
 Bryan, E. S., 97, 129, 426
 Bryngelson, B., 136, 426
 Bühler, C., 19, 25, 44, 77, 80, 122, 162,
 209, 221-222, 237, 240, 249, 374,
 408, 426-427
 Bühler, K., 22, 221, 300, 427
 Bühler-Hetzer infant scale, 35
 "Bull sessions," 354
 Bullying, 230-231, 237, 395
 Bundling, 389
 Burk, C. F., 280, 427
 Burnside, L. H., 25, 125, 140-141, 145,
 427
 Burstein, M., 246, 437
 Burt, C., 338-339, 427
 Butterfield, O. M., 382, 427
 Buttoning, 135-136, 149

C

Caldwell, O. W., 251, 427
 "Calf love," 375-377
 characteristic behavior of, 376
 sources of, 376
 Camera studies, 140
 Camp Fire Girls, 234
 Campbell, E. H., 368, 371, 427
 Canestrini, S., 96, 99, 427
 Career, life, 404
 Carelessness, 327
 Carlson, A. J., 100, 427
 Cartoon, 287
 Case, A., 347-348, 428

Case history, 117
 Castner, B. M., 35, 428
 Castrated animals, 122
 Cattell, J. McK., 73, 428
 Caution, 191
 Century, of the child, 7
 seventeenth, 3-4
 eighteenth, 4
 nineteenth, 5-7
 twentieth, 7-11
 Cephalocaudal sequence, 34, 125
 Chaney, B., 86, 428
 "Character books," 269
 Chassell, C. F., 343-344, 428
 Chassell, L. M., 344, 428
 Cheating, 237, 340
 in school, 339
 studies of, 337
 Chickenpox, 123
 Child study, 3
 handicaps to, 11-13
 methods of, 8, 13-19
 movement, 5-6, 8
 periodicals, 6
 societies, 6
 Child welfare organizations, 7
 Childhood, 44, 104, 107, 123, 149, 176,
 181, 213, 397
 friendships during, 239
 religion of, 347
 romances of, 370-371
 Children, gifted, 183
 maladjusted, 7
 Chorion, 55
 Christianity, 2
 Christmas, 349
 Chromosomes, 49-50, 62, 68
 X and Y, 62
 Church, 336-337, 352, 356
 attendance at, 342, 348, 352
 connections of, 337
 schools and, 353
 Church service, 355
 Cinderella, 380
 Cinema records, 145
 Circulatory system, 117
 Circumcision, 99
 Clark, F. M., 94, 136, 428
 Clark, W. R., 279-280, 428
 Cleavage, 54
 Climbing, 147, 241
 of steps, 147

- Clinics, 10
- Clothes, 183
- Clothing, 84, 419-422
 - hampering, 152, 421
 - influence of, 422
 - styles of, 233, 380
- Clumsiness, 147, 149
- Code of behavior, 329
 - moral, 322, 326, 329
- Cohen, J. H., 236, 454
- Colds, 216
- Collecting, 253, 267-268, 282
- College study, 358
- Color, 295, 413, 421
 - combinations of, 306
 - "favorite," 305
 - preferences for, 304-306
 - vocabulary of, 169
- Comedy films, 310
- Comenius, J. A., 3, 4, 12
- Comic, perception of, 307
 - subjective, 311
- Comic strips, 273-274
- Commands, 182
- Communication, 161
- Companions, 219, 239, 244-245
 - bad, 336
 - choice of, 244-248
 - gang age, 247
 - influence of, 336
- Companionship, 235
- Competition, 205, 228, 237, 371
- Complex, Electra, 396
- Oedipus, 396
- Comprehension, 165, 200, 343
 - norms for, 166
 - religious, 342
 - vocabulary of, 165
- Concentration, 258
- Concepts, 287
 - abstract, 319
 - animistic, 288
 - children's, 285-286
 - general, 286
 - moral, 318, 320-322, 335-337
 - number, 295
 - religious, 342, 345-348, 352
 - of right and wrong, 325
 - of roundness, 294
 - of self, 299
 - social, 301
 - specific, 286
- Conditioned reflex technique, 8,
- Conditioned response, 159
- Conditioning, 101, 190, 192, 194
 - direct, 201
- Conduct, 321
 - disorders, 335
- Confidences, 382
- Conflicts, among children, 229
 - emotional, 355
- Congenital blindness, 71
- Conklin, E. S., 356, 410, 429
- Conn, J. H., 387, 429
- "Conquests," 399
- Conradi, E., 172, 429
- Consciousness, of newborn, 100
 - social, 233
- Contacts, social, 136, 137, 321
- Contents of children's minds on entering school*, 6, 15, 347
- Contrariness, 228
- Controlled observation method, 17
- Conventionality, 242, 420
- Conversational interests, 183
- Conversations, 181-182, 184
 - in childhood, 181
 - domination of, 399
 - about sex, 388
- Conversion, 355-356
 - religious, 355-356
 - types of, 356
- Cooing, 163
- Cook, W. M., 169, 305, 429
- Cooperation, 231, 244, 371
 - social, 224
- Cooperative play, 227
- Coordination, 142, 145, 148, 149
 - of arms, 145
 - defensive, 130
 - eye-hand, 131-132
 - of leg movements, 120
 - motor, 149, 412
 - in walking, 145
- Corneal reflex, 61
- Corporal punishment, 332-333, 395
- Corey, S. M., 249, 454
- Co-twin control method, 28-31, 160
- Courtship, 366, 379
 - pattern of, 379
- "Cracking" of voice, 122
- Crawling, 29, 126, 141-142, 147
- Cravon. 137: 415

Creative expression, 382, 415
 fervor, 411, 412, 418
 Creeping, 29, 126, 141-142, 144, 147, 200
 movements of, 140
 Cretinism, 39, 41, 71, 103
 Cries, 161
 Crime, 338, 395
 Criticism, 181, 195, 336, 414, 417, 418-419
 "Crowd," 233-234, 238
 "Crush," 15, 373, 395
 adolescent, 374
 behavior, 374
 frequency of, 375
 object of, 374
 "Crush age," 395
 "Cry baby," 399
 Crying, 60, 87, 94, 100, 162, 184, 189-190, 192, 200, 204, 210, 221-222, 224, 229, 398-399, 401
 bodily accompaniment of, 89
 "spoiled," 162
 variations in, 162
 Cube behavior, 35
 Cultural patterns, 303
 Cup, 134
 Curiosity, 214, 290, 292-293
 object of, 387
 about religious subjects, 344
 responses in, 214
 about sex, 372, 386, 388-389
 stimulus to, 214
 Custom, 363, 366
 Cutaneous sensitivity, 66
 Cutting, 137
 with scissors, 241
 Cytoplasm, 49

D

Dallying, 297
 Dancing, 182
 social, 384
 Darwin, C., 5
 Darwinian reflex, 7, 22, 86
 Dashiell, J. F., 306-307
 "Dates," 182, 384
 Davenport, F. I., 389
 Davis, E. A., 175-176, 178, 184, 186, 290
 Davis, K. B., 389, 392-393
 Dawson, G. E., 350
 Day, E. J., 186

Daydreaming, 122, 207, 240, 382, 407-410
 in adolescence, 410
 of childhood, 408
 "conquering hero," 385, 407, 410
 evaluation of, 411
 excessive, 385
 foster child, 410
 martyr, 207
 in preadolescence, 409
 peak of, 411
 romantic, 374
 "suffering hero," 407, 410
 theme of, 408
 Deafness, 103, 185
 Dearborn, G. V. N., 5, 8, 430
 Death, 344
 Decidua, 55
 Defensive coordinations, 130
 Delayed speech, 183
 Delight, 190, 208
 Delinquency, 335-338, 340
 in boys, 338
 in children, 322, 336-337
 in girls, 335
 juvenile, 339-340
 sexual, 248, 340
 Delinquent behavior, 340
 Delman, L., 82
 Dennis, M. G., 14, 28, 430
 Dennis, W., 14, 28, 82, 288, 430
 Desire, to appear older, 403
 for attention, 397
 for independence, 402
 thwarted, 340
 Destructiveness, 401
 Development, 20, 344
 causes of, 26-27
 characteristics of, 34-40
 delayed motor, 150
 emotional, 187, 190
 factors influencing, 40-43
 locomotor, 140
 methods of studying, 23-25
 moral, 317-318, 323, 334, 353
 stages in, 323
 neutral, 65
 of meaning, 289
 of moral behavior, 318
 of moral concepts, 320
 of perception, 293
 rates of, 25-26

- Development, of religious interests, 342,
343
of self-feeding, 135
sex, 363-365, 368, 396
social, 218, 233, 242
sex, 368
(See also Social development)
- Developmental pattern, 33-34, 127, 255,
365
- Developmental periods, 43-45
- Developmental sequence, 126, 142
in play activities, 255
in self-feeding, 135
- Developmental stages, 142
- Dewey, J., 323, 430
- Diary, 343, 354, 364, 382, 418
- Dickson, V. E., 327, 430
- Digestive system, 117
disturbances of, 216
- Dilloit, M. S., 387, 392, 430
- Dimock, H. S., 238, 350, 430
- Dionne quintuplets, 67
- Diphtheria, 123, 151
- Direction, judgments of, 293
- Disapproval, 335
social, 235-236, 328
- Discipline, 207, 318, 330, 332, 336
principles of, 330
types of, 217, 331
- Discrimination, social, 237
- Discussions, 183, 357-358
of sex, 364
- Discases, 71, 122, 216
importance to personality, 123
periods of susceptibility to, 123
- Disher, D. R., 98, 430
- Dishonesty, 327-328; 340
- Disobedience, 240, 297, 326
- Disorderliness, 327
- Disposition, 122
- Dissatisfaction, 122
- Distance, judgment of, 293-294
- Distraction, 201
- Distress, 190, 356
- Doll, 241
play, 241, 256
- Doubt, 342, 345, 358
religious, 342, 345, 348, 350, 357-359
- Douglass, H. R., 296, 431
- Dramatization, 262-263
- Drawing, 287, 302, 412, 418
of adolescents, 414
- Drawing, crayon, 302
stages in ability, 412
subjects of children's, 413
- Dreams, 197
- Dress, 236, 337
- Dressing, 135-137, 297
- Dressing up, 241
- Dresslar, F. B., 314, 431
- Drinking, 134, 389, 401
- Drought, A., 303, 431
- Dudychea, C. J., 330, 350-351, 358-359,
431
- Durost, W. N., 267, 431
- Dysinger, W. S., 337, 431
- E
- Eagleson, B. M., 301, 440
- Eating, 134, 297
habits of, 121
- Echo, 395
- Ectoderm, 55
- Education, constructive, 390
preventative, 390
sex, 389-391
types of, 390
- Education of man*, 4
- Egocentric religion, 349
- Egocentric speech, 181
- Eisenberg, A. I., 278-279, 431
- Electra complex, 369
- Elimination through disuse, 201
- Elkine, D., 298, 431
- Ellis, H., 74, 431
- Embryo, 46-47, 67
period of, 46, 54, 58
- Émile*, 4, 12, 14
- Embarrassment, adolescent, 150
- Emotional accompaniment, 359, 377
- Emotional attitudes, 343
- Emotional behavior, 187, 189, 192, 196
- Emotional conflicts, 355
- Emotional development, 187, 190
- Emotional episodes, 189
- Emotional experiences, 189
- Emotional outbursts, 195-196, 400
- Emotional patterns, 197
- Emotional reactions, 194-196
- Emotional responses, 187-189, 191-192,
195, 353
- Emotional states, 195
- Emotional upsets, 354

- Emotionality, 102, 215-217, 349
 character of child's, 194
 childhood, 194
 factors influencing, 215
 habits of, 217
 Emotions, 90, 187-188, 195, 418
 of children, 194-196
 genetic sequence in, 188
 of the newborn, 90
 Endocrine disorders, 71
 Endocrine glands, 187
 Endoderm, 55
 Environment, 149, 184, 217, 283
 social, 183, 217
 Episodes, emotional, 189
 Equilibrium, 144
 Erect posture, 128
 Errors in perception, 312, 315
 variation in, 315
 Ethical knowledge, 322
 "Etiquette" vocabulary, 169
 Eustachian tubes, 55
 Evolution, 7
 Excitement, 190, 215, 217
 Exhibitionism, 394
 Experiences, emotional, 189
 religious, 357, 361
 Experimental cabinet, 78, 94-95
 Exploration, sensory, 289
 Explosive sounds, 70, 89, 157, 161-163
 Eye, movements of, 128
 troubles of, 123
 Eye coordination, 126, 128-129
 Eye-hand coordination, 131, 136
- F
- Face, proportions of, 109
 Facial expressions, 301
 Falling, 143, 145, 147
 Fallopian tube, 52-54
 Family, influence of, 335
 Fat, 120
 Fatigability, 123
 Fatigue, 215-216
 Fear, 90, 121, 147, 154, 187, 192-194,
 196-197, 201, 211, 400
 changes with age, 200-201
 conditioned, 192, 197
 elimination of, 201-202
 origin of, 197
 Fear, reactions of, 191
 repressed, 195
 responses of, 192, 198
 patterns of, 199-200
 severity of, 201
 stimuli to, 198-199
 of strangers, 199
 what children, 197
 Fears, number of, 201
 Feeding, 152
 Feeling, group, 336
 of inferiority, 151, 397
 Feelings, pent-up, 418
 Fect, 110, 122, 144-145
 Fenton, J. C., 307, 432
 Fernald, G. M., 335, 432
 Fertilization, 52, 54
 Fetishism, 395
 Fetus, 46, 48
 period of, 46, 57
 Fialkin, H. N., 75, 432
 Fighting, 223
 Finger-painting, 415
 Fisher, M. S., 181, 432
 Fite, M. D., 230, 232, 322, 335-336, 432,
 438
 Flaccus, L. W., 420, 432
 Flirtations, 378
 Flory, C. D., 99, 130, 432
 Folsom, J. K., 384, 432
 Fondling, 367, 395
 Fontanelles, 112
 Food, 71
 Foot positions in walking, 145
 Footprints, 140, 145-146
 Forbidden romances, 384
 Ford, F. A., 281, 426
 Fork, 134
 Forlano, G., 75, 247, 447
 Form perception, 295
 Formal design, 413
 Foster, S., 207, 432
 "Foster child" daydream, 410
 Fox, J. F., 284, 432
 Franklin, E. E., 405, 432
 Free-association test, 353
 Freedman, H., 247, 447
 Freeman, H. A., 349, 432
 Freeston, P. M., 404, 432
 Freudian school, 16, 398
 Freudianism, 366
 Freud, theory of sex, 365

- Friendships, 229-230, 239, 354, 374
 - college, 249
 - high school, 248
- Froebel, F., 4, 12, 432
- "Funny paper," 283
- Funny test, 310
- Furfey, P. H., 233, 241, 270, 368, 432-433

G

- Gait, 147
- Galton, F., 74, 433
- Gaines, 147, 150, 236, 267, 269, 368, 377
 - in adolescence, 271
 - ball, 149
 - "Bo-peep," 210
 - card, 234
 - of childhood, 269
 - of gang age, 270-271
 - group, 233
 - individual, 233
 - of intellect, 271
 - "mother," 269
 - neighborhood, 269-270
 - peekaboo, 222, 269
 - tag, 241
 - team, 234, 244, 271
 - types of, 269-270
- Gametes, 50
- Gang, 225, 233, 326
 - activities of, 234-235
 - behavior of, 233
 - characteristics of, 234
 - influence of, 233
 - leadership in, 251
 - life of, 237
 - meeting place of, 234
 - member of, 196
- Gang age, 44, 196, 232-233, 242, 244, 251, 257, 270, 321, 326, 400
 - companions of, 247
- Garrett, H. E., 249, 433
- Gates, A. I., 32, 149, 433
- Gates, G. S., 215-216, 301, 433
- Genetic development, 191
 - of crying, 191
 - of fear, 191
- Genetic pattern, 191
- Genetic sequence, of crayon and paper
 - behavior, 415
 - of emotions, 188, 190
- Genetic study, of babies, 136
 - of large groups, 32-33
- Genital differences, 387-388
- Genital organs, 389
- Genitalia, 120
- Genitals, 388
- Genius, 37, 73
- Germ layers, 55
- Gesell, A., 8, 17-19, 24-25, 28-29, 33-35, 37-39, 125, 129, 131-132, 135, 151-153, 155, 162-164, 167, 174, 184, 188, 219-221, 255, 412, 413, 415, 433
- Gestures, 161-162, 164-165, 174, 223
- Giesecke, M., 136, 433
- Gifted children, 183, 281-283
- Giggling, 400-401
- Gilmer, B. von H., 81-83, 434
- Ginsburg, H., 100, 427
- Girl Scouts, 234
- Gland treatment, 26
- Glands of internal secretion, 41
 - sex, 365
- Glandular deficiency, 122
- Glans, 58
- Gloating, 196
- God, 337, 344-349, 351-352
 - concepts of, 345, 348
- Goddard, H., 9
- Gonad, 26, 49, 119, 122, 366
- Gonorrhea, 71
- Good humor, 195
- Goodenough, F. L., 149, 188, 203, 205, 295, 434
- Gossiping, 207
- Goteu, P., 152, 454
- Graaf, Regnier de, 47
- Gradations of emotions, 195
- Grammatical errors, 175, 186
- Grasping, 131-133
 - reflex, 130
 - types of, 133
- Greece, 2
- Green, E. H., 230, 434
- Green, G. H., 408, 434
- Greenberg, P. J., 228, 434
- Gregarious behavior, 218
- Grief, 190
- Griffin, H. C., 354, 434
- Group, social, 102, 218, 303, 397
- Group authority, 336
- Group feeling, 336
- Group loyalty, 244

Group patterns, 237
 Group studies, 77
 Growth, 102, 344
 cycles of, 103
 of different organs, 104
 within a year, 104
 mental, 102
 physical, 102, 149
 Guanella, F. M., 263, 434
 Guilty conscience, 324

H

Habit, 205
 building of, 320
 Hagman, E. P., 245, 435
 Hagman, S. R., 194, 198, 435
 Hair, 60, 119, 122
 pubic, 119-120
 Hall, G. S., 5-6, 15, 309, 313-314, 347, 350, 435
 Halverson, H. M., 25, 35, 131-132, 435
 Hand skills, 137
 Handedness, 136-137
 explanations of, 136-137
 left, 136
 Hands, 110-111, 122
 control in eating, 134
 motor development of, 128, 130
 Haploid cell, 50
 Happiness, 195, 208
 Harris, D., 381, 435
 Harris, D. B., 322, 424
 Hartshorne, H., 319, 322, 328, 335-339, 435
 Hartson, L. D., 233, 436
 Hate, 187
 Hatred, 372
 Hattendorf, K. W., 386-387, 436
 Hattwick, L. A., 220, 436
 Hauser, P. M., 338, 425
 Head, 108, 141, 144
 holding up of, 128-129
 proportions of, 108
 Headaches, 123
 Health, 280, 381
 poor, 216
 Healy, W., 336-338, 436
 Hearing, 67, 96
 of newborn, 96
 Heart, 103, 117
 troubles of, 123

Heaven, 344, 347
 Height, 104, 119, 144, 152
 at puberty, 105
 Helplessness, 200
 Hendry, C. E., 238, 430
 Herbart, H., 4, 12
 Herbst, E. K., 226, 453
 Heredity, 49
 Hero worshiping, 376
 Heterosexual love, 375
 Heterosexuality, 371
 Hetzer, H., 77, 97, 184, 221-222, 399, 427, 436
 Hiccuping, 87, 90
 Hicks, J. A., 31, 436
 Hide-and-seek, 241
 Hilgard, J. R., 29, 31-32, 436
 Hill, G. E., 274, 322, 436
 Hitching, 141
 Hobby, 264
 Hollingworth, L. S., 10, 106, 282, 304, 341, 355, 373, 406, 437
 Holmes, F. B., 193, 197-198, 200-202, 437-439
 Home, criticism of, 419
 Home interests, 182
 Homes, broken, 335
 Homicide, 340, 377
 Homosexual behavior, 396
 Homosexual love, 375
 Homosexuality, 374
 Honesty, 328
 Hopping, 147
 Hsiao, H. H., 73, 437
 Huff, R. L., 314, 437
 Hugging, 212-213; 374, 378
 Hughes, W. L., 389, 437
 Hulson, E. L., 265, 437
 Humor diaries, 311
 Hunger, 100
 Hunt, W. A., 94, 437
 Hurlock, E. B., 14-15, 125, 236-237, 240, 246, 287, 316, 375, 406, 420, 437-438

I

Idiots, 131
 Illness, 123, 151, 184
 Illusions, 314
 Imagination, 200
 creative, 38
 vivid, 313

- Imaginary playmates, 246
 Imitation, 194, 197, 210, 224, 300
 social, 201
 Implantation, 51
 Inattentiveness, 327
 Incentive, 153, 236
 social, 237
 to speak, 158
 Independence, desire for, 402
 Indigestion, 123
 Individual diagnosis, method of, 16
 Individual differences, 9, 37, 61, 85, 98-
 99, 105, 108, 118, 128, 142, 147,
 149, 205, 207, 232, 360
 Infancy, 43, 76
 Infant, 76
 newborn, 76
 prematurely born, 48
 Infantile behavior, 207
 Infantile features, 79
 Influenza, 216
 Information about sex, 388-389
 sources of, 388
 Insight, 353
 moral, 322
 Instinct, 137
 "Instinctive," 184
 Intelligence, 40, 73, 102, 118, 137, 183-
 184, 244, 281, 292, 353, 381
 and laughter, 309
 and morality, 338
 and vocational choice, 406
 low-grade, 154
 social, 237, 249
 superior, 250, 480
 I.Q. scores, 236
 Intelligence tests, 159, 166, 228, 299
 group, 236
 Interchanges in speech, 178
 Intercourse, sexual, 378
 Internal organs, 56, 58, 60, 116
 changes in, 116
 Irritability, 340
 Intra-uterine development, 49
 stages in, 54
 Introspection, morbid, 355
 Introspective method, 94
 Irritability, 215
 Irwin, O. C., 81-82, 84, 93-94, 438
 Isolation, desire for, 239-240
 Isolation cabinet, 17
 Isolation technique, 188
 Jack, L. M., 250, 438
 Jackets, 136
 Jacks, 241
 James, W., 100, 285, 438
 Jansing, C., 406, 437
 Jealousy, 187, 196, 205, 208, 211, 382
 clinical studies of, 205
 peak of, 207
 responses, 207
 stimuli to, 205
 toward parent, 206
 toward sibling, 206
 Jenkins, G. G., 249, 438
 Jensen, K., 99, 438
 Jersild, A. T., 31, 193, 197-198, 200-202,
 230, 232, 246, 291, 346, 404, 408-410
 438-439
 Jersild, C. L., 246, 404, 408-410, 439
 Jesus, 345-346, 351
 Jimmy and Johnny, 29, 30, 127, 139, 146
 Johnson, B. J., 149, 257, 284, 302-303,
 439
 Jokes, practical, 210
 Jones, H. E., 73, 191, 199, 439
 Jones, M. C., 25, 29, 128, 132, 191, 199,
 201, 203, 209, 221-222, 439
 Jordon, A. M., 273-274, 439-440
 Joy, 187-188, 196, 208
 controlled, 195
 responses in, 211
 stimuli to, 208
 "Jumpiness," 195
 Jumping, 147, 241
 method of, 147
 Justin, F., 308, 440
 Juvenile delinquency, 339
 causes of, 338
 forms of, 340
 K
 Kambouropoulos, P., 311, 444
 Katz, S. E., 306, 352, 440
 Kellogg, W. N., 301, 440
 Kenderdine, M., 308-309, 440
 Key, C. B., 135, 440
 Kicking, 141, 204
 Kimmins, C. W., 309, 440
 Kindergarten, 147, 232, 416
 Kindergarten children, 184, 228, 296

- Kindergarten equipment, 294
 Kirby, T. J., 236, 440
 Kissing, 182, 212-213, 367, 374, 378, 395
 Klein, E. R., 15, 375, 437
 Klein, M., 16, 440
 Knauber, A. J., 413, 440
 Knee jerk, 61
 Knife, 134
 Knowledge, 353
 moral, 335
 Koeh, H. L., 246, 440
 Koffka, K., 100, 440
 Kuhlmann, F., 8-9, 132, 155, 440
 Kupky, O., 343, 351, 440
- L
- Labyrinth reflex, 58
 Laird, D. A., 15, 440
 Langerhans, islets of, 58
 Language, 157, 161, 343
 habits of, 60
 secret, 171-162
 Lanugo, 59, 61
 Laughing, 123, 189, 209-211, 224, 300,
 399-401
 causes of, 210
 Laughter, 210, 308
 and intelligence, 309
 Laughter-producing situations, 308
 two kinds of, 210
 Law of developmental direction, 125, 128
 Laws, attitude toward, 336
 Lawton, G., 197, 441
 Leader, 249-250
 adolescent, 252
 child, 250
 high school, 252
 student, 252
 types of, 250, 252
 Leadership, 244, 249
 in early childhood, 250
 first appearance of, 249
 gang, 251
 Leal, M., 244, 441
 Learning, 26-27, 33, 128, 160, 187-188,
 192
 opportunity for, 148-149, 154
 "Lecturing," 203
 Legs, 110, 141, 143-144, 147, 152
 motion of, 147
- Lehman, H. C., 240-241, 257, 262, 269,
 274, 280, 282-283, 349, 368, 384,
 405-407, 418
 Leisure time, 283
 Leonard, E. A., 327, 441
 Leuba, C., 228, 441
 Leuba, J. H., 343, 348, 352, 441
 Lies, children's, 327
 types of, 327
 Life career, 404
 choice of, 404
 Lima, M., 272-273, 283, 452
 Lippman, H. S., 134, 442
 Lipping, 178-179
 Literary career, 418
 Liver, 55
 Locomotion, 140-142, 144
 Locomotor development, 140
 Locomotor skills, 148
 Locke, J., 4, 14, 442
 Lockhart, G., 326, 442
 Long, L., 294, 442
 Loomis, A. M., 19, 442
 Lord, E. E., 153, 184, 433
 Lord's prayer, 347
 "Lost manhood," 121
 Love, 90
 affairs of, 355
 calf, 375-376
 heterosexual, 375
 homosexual, 375
 object of, 366
 "puppy," 377-379, 383
 romantic, 378-381
 unhappy, 384
 Love letters, 382
 Love life, 206
 Love "thief," 383
 Loved one, 382
 services for, 382
 Loyalty, group, 244
 Lunar month, 56-57
 Lungs, 55, 116, 117
 Lutz, W. F., 118, 442
 Lying, 237, 340
- M
- McCarthy, D. A., 158, 167-168, 173-174,
 176, 181, 186, 291, 443
 McCarty, S. A., 413, 443
 Macaulay, E., 322, 420-421, 442

- McDougall, W., 323, 443
 McFarland, M. R., 213, 443
 McGinnis, J. M., 129, 443
 McGraw, M. B., 29-30, 86, 127, 139-140, 145-146, 156, 444
 McHugh, G., 14, 125, 438
 Major, D. R., 5, 8, 443
 Maladjusted children, 9, 17
 Maladjustments, 385
 forms of, 392
 in adolescence, 391
 sexual, 391-392, 394-395
 Maller, J. B., 75, 237, 371, 443
 Malnutrition, 151, 216
 Markey, F. V., 246, 261, 404, 408-410, 443
 Marquis, D. R., 101, 443
 Marriage, 182, 384-385, 389, 396
 Marvin, D., 381, 443
 Mass activity, 81-82
 Masturbation, 392, 395
 beliefs concerning, 394
 frequency of practice, 392
 prevention of, 394
 traditions about, 393
 Matched group method, 31-32
 Maternal impressions, 69
 Maturation, 26-27, 124, 128, 160, 187-188, 190
 of sex cells, 49
 of skills, 124
 studies of, 27-33
 Maturing, sexual, 102, 240, 350, 365
 Manipulation, motor, 289
 Masochistic behavior, 395
 Mather, W. G., 381, 443
 Maudry, M., 223, 443
 May, M., 319, 322, 327, 335-339, 435
 Mead, C. D., 15, 154, 183, 186, 444
 Meanings, 287-288
 development of, 289
 perception of, 292
 Measles, 123
 Meconium, 59
 Neck, L. H., 33, 444
 Melcher, R. T., 35, 444
 Meltzer, H., 301, 444
 Melville, A. H., 170, 172, 444
 Menstrual flow, 119-120
 Menstruation, 121-122, 237, 240, 372
 Mental deficiency, 39
 Merrill, M. A., 166, 292, 299, 303, 452
 Mesoderm, 55
 Method of isolation, 27-28
 Middle Ages, 2
 Miller, A. M., 275, 444
 Millichamp, D. A., 188-189, 425
 Miniature adult, 21, 343
 Minkowski, M., 48, 444-445
 Misbehavior, 401
 at gang age, 401
 Mischievousness, 326
 Misconceptions, 312
 causes of, 312
 Misdemeanors, 236, 240, 326
 Money vocabulary, 169
 Mongolism, 39, 41
 Monologues, 181
 Monster, 70
 Month of birth, 74
 Mood, 195
 Moodiness, 195, 377
 Moody age, 195
 "Mooning," 376
 Moore, J. E., 149, 445
 Moore, K. C., 5, 445
 Moping, 122, 240
 Moral behavior, 318-319
 Moral codes, 322, 326, 329
 stages in development of, 323
 Moral concepts, 318, 320-322, 336-337
 Moral development, 317-318, 323, 334, 353
 stages in, 323
 Moral insight, 322
 Moral knowledge, 333
 phases of development, 318
 Moral propositions, 330
 Moral standards, 330, 337
 Moral training, 254, 336
 Morality, 317
 in adolescence, 328
 in babyhood, 323
 in early childhood, 324
 intelligence and, 338
 in late childhood, 324
 nature of, 317
 standards of, 326
 true, 318
 Morgan, J. J. B., 327, 445
 Moro-embrace reflex, 86-87, 94
 Mother image, 396
 Motivation, 153
 Motor activity, 181

Motor control, 289
 Motor development, 124, 137, 152
 of arms and hands, 128-130
 causes of, 151
 characteristics of, 125
 delayed, 150, 152
 effect of illness on, 151
 in hand region, 128
 of legs, 128, 140, 147
 methods of studying, 125, 140
 norms of, 155
 pattern of, 128
 stages of, 126-127
 of trunk, 128, 138
 Motor manipulation, 289
 Motor sequence pattern of, 126
 Motor skills, 147-148
 norms of, 148
 Motor traits, 151
 Movement, accuracy of, 148-149
 Movies 142, 187, 234 256, 267, 274
 337
 influence of, 276, 338
 preference for 275-276
 Mudge, E L , 347, 445
 Multiple births, 67
 Mumps, 123
 Muntz, L , 174, 445
 Murchison, C 4 445
 Murphy, G , 220 445
 Murphy, L B , 182, 214, 229, 231-232,
 261, 345, 403, 420, 445
 Muscle tissue, 115
 Muscles, 115, 120, 126
 control of, 124 153
 coordination of, 152
 Music, 416 418
 appreciation of 306-307
 composing, 382
 producing, 411
 Musical expression, 416
 Musical instruments, 416, 418
 Musical talent, 416
 Mysteries, 344

N

Narcissism, 395
 Narcissus, 395
 Naughtiness, 207
 "Necking," 192, 381 389
 Negative adaptation, 201

Negative phase, 239-240
 behavior during, 240, 242
 causes of, 241
 Negativism, 185, 204, 223, 227-228, 400
 Negro, 61, 75, 85
 Nickula M , 223, 443
 Nelson, A K , 80-81, 83, 93, 95, 97-99,
 447
 Nelson, E , 352, 445
 Neonate, 76
 Nervous system, 115, 128
 development of, 115
 Nervous tension, 154
 Nervousness, 123
 Neurotic tendency, 395—
 Neuroticism, 249 —
 Newborn 76, 111
 conditioning of, 101
 consciousness of, 100
 emotions of, 90
 period of, 76
 scientific procedure in studying, 77
 sensitivities of, 94
 vocalization of, 88
 Newcomb, T M , 220, 415
 Newhall, S M 288, 446
 Nice, M M , 174, 446
 Nicknames, 231
 Normative studies 125
 Normative summaries, 155, 162, 166
 Norms of motor skills 148
 Nose 109 122
 Nose bleeds, 123
 Number concepts, 296
 Number vocabulary 169
 Nucleus, 49
 Nursery school, 204, 226, 232, 416
 children of, 192, 214, 220, 322, 335-
 336, 392
 Nutrition, 152
 Nyctagmus, 120

O

Oakden, E C , 298-299, 446
 Observational method, 8
 Ocular pursuit movements, 129
 Oedipus complex, 396
 Ogburn, W F , 73, 446
 Older, desire to appear, 403
 Onlooker behavior, 226

missions in speech, 178
 Ontogenetic activities, 30, 33
 Optic nystagmus, 128
Orbis pictus, 3
 Order of birth, 73, 216
 Organic sensitivities, 100
 Ossification, 60, 112
 Outbursts, angry, 203
 emotional, 195-196, 400
 Outtoeing, 145
 Ovary, 49, 120
 Ovulation, 52
 Ovum, 46, 51
 period of, 46, 54

P

Pain, 66, 98-99
 Painting, 415
 finger-, 415
 Pancreas, 55
 Panic, 192
 Parallel play, 225-226
 activities of, 227
 "Parrot talk," 157, 169, 296
 stage of, 159
 Parten, M. B., 226-227, 245, 250, 261,
 265, 446
 Partics, 233, 235, 238, 384
 Partridge, E. D., 248, 251, 256, 383-384,
 446
 Partunate, 76
 Pathological conditions, 364
 Pathological manifestations of sex, 363
 Patterns, cultural, 303
 of development, 375
 of sex, 365
 emotional, 197
 genetic, 191
 group, 237
 in religious development, 344
 Patting, 212-213, 367
 Pavlovian school, 101
 Paynter, R. H., 335, 446
 Peck, M. W., 388, 446
 Peiper, A., 95, 446
 Perception, 293, 300
 aesthetic, 293, 302
 comic, 293, 307, 309-311
 errors in, 312
 experimental investigations of, 293
 form, 294-295
 Perception, number, 293
 self-, 293
 social, 293, 300
 space, 293-294
 time, 293, 297-298
 visual, 294
 weight, 293, 295
 Peristaltic movements, 57
 Perrin, F. A. C., 380, 446
 Personality, 122
 development of, 123
 disturbances of, 123
 freak, 252
 Perspiration, excessive, 121
 Pestalozzi, 4, 12
 Peterson, F., 77, 95-98, 447
 Peterson, W. F., 75, 447
 Pets, 280, 366-367
 Petting, 381-382, 389
 motives for, 382
 Philosophy of life, 360
 Phylogenetic functions, 29-30, 33
 Physical attractiveness, 380
 Physical beauty, 379
 Physical changes, 122
 Physical growth, 102, 123
 methods of studying, 103
 normal, 102
 Physical organs, malfunctioning of, 103
 Physical proportions, 79, 108
 Physiological functions, 79-80
 Physique, 102
 Piaget, J., 181, 288, 323, 447
 "Pig Latin," 172
 "Pimples," 121-122
 Pineal gland, 120
 Pintner, R., 9, 74-75, 247, 447
 Placenta, 55, 59, 64, 79
 Plantar flexion, 58, 61
 Plateau stage, of development, 25, 76
 in speech, 161
 Plato, 13-14
 Play, 102, 123, 148, 200, 220, 226, 228,
 236, 253, 368
 age of, 257
 associative, 227
 characteristics of, 255
 childhood, 258
 clothes for, 259
 constructive, 259-260, 263
 cooperative, 227, 231
 definition of, 253

- Play, doll, 241, 256
 in early childhood, 259
 equipment for, 284
 factors influencing, 280
 free, spontaneous, 259-260
 group, 226, 236-237, 239
 individual, 236
 interests in, 240, 270
 interview technique, 388
 in late childhood, 267
 make-believe, 259-262
 materials for, 223, 266
 mud-pie, 415
 parade, 225-226
 situations, 335
 solitary, 225-264
 time spent in, 258
 toy, 255
 types of, 233
 unsexual, 368
 value of, 254
 verbal, 210
 with opposite sex, 384
 Play activities, 122, 225, 253, 257-258
 juvenile, 241
 source of, 253
 specific, 258
 Playing house, 241, 261-262
 Playing school, 241
 Platyrrhini, 123, 195-196, 223, 225, 239-240, 282, 336, 367, 399, 417, 419
 imaginary, 246
 Pleasure, 189, 208
 sexual, 395
 Pneumonia, 123, 151
 Poetry, 273
 writing, 355, 382, 418
 Pollinodius, 50
 Possessions, 403
 Postnatal control, 126
 Poull, L. J., 407, 447
 Praise, 220, 236
 Pratt, K. C., 78, 80, 81, 83-85, 93-99, 447
 Prayers, 349, 351, 355
 children's, 346
 Preadolescence, 25, 44, 233
 Preadolescent, 122, 239, 240
 "Pregnant age," 225
 Pregnancy, 363
 Prosocial behavior, 220
 Prespeech, 162
 Proximodistal direction, 125
 Prenatal development, 46, 125
 factors influencing, 70
 periods in, 46
 Prenatal nutrition, 64
 Prenatal period, 43
 Preschool child, 10, 194, 199, 207, 229, 412
 Prespeech, norms of, 164
 Pressure, 98
 social, 200
 "Prettiest thing," 303
 Prewer, W., 5, 77, 96, 98, 447
 Primitive people, 2
 Primogeniture, law of, 73
 "Problem behavior," 39
 Pronunciation, 160, 176, 399
 affected, 400
 correct, 176
 faulty, 176
 in childhood, 176
 Property rights, 324
 Proportions, of arms and legs, 110
 of body, 128
 of face, 109
 of head, 108
 of trunk, 110
 Propositions, moral, 330
 religious, 359
 Prostitution, 340
 Psychoanalytic movement, 366
 Psychogalvanic response, 337
 Psychological Clinic, 16
 Psychometric method, 16
 Puberty, 103-104, 115, 117-118, 120, 122-123, 149, 239-241, 256, 270, 356-366, 368-369, 372, 395
 age of, 342
 changes during, 26, 119
 criteria of, 119
 psychological effect of, 121
 Puberty precocious, 41, 122
 Puffer, J. A., 233, 250, 447
 Pullias, E. V., 393-394, 447
 Punishment, 195, 331-332, 335, 337, 349, 392
 in adolescence, 333
 corporal, 332-333, 395
 improvement in, 334
 "stock," 333
 Punning, 210, 400
 "Puppy love," 377, 379, 383
 characteristic behavior of, 377
 end of, 378

Q

- Quarantine, 123
- Quarreling, 204, 229-230, 367, 369
 - verbal, 207
- Quarrels, 383
- Questioning, 289-290
 - age of, 214, 289-290
 - role of, 289
- Questionnaire method, 6, 15, 364
- Questions, 181-182, 214, 399
 - 'comprehension,' 293
 - about sex, 386-387

R

- Radio, 267, 277-278, 416
 - program preference, 278-279
- Rage, 90
- Raine, L. H., 77, 95-98, 447
- Random movements, 124
- Ransom, R., 192-193, 454
- Reaching, 131-132
- Reactions, angry, 202
 - emotional, 194-196
 - social, 223
- Reading, 122, 200, 214, 235, 240, 267, 272, 275, 282, 357, 362
 - ease for, 273
 - interests in, 272-273, 283, 292
 - role of, 291
- Reasoning, 195
 - faults, 313
 - role of, 292
- 'Rebirth of artistic ability' stage, 413
- Reconstruction of beliefs, religious, 360-361
- Reflexes, 85-87
- Reform, 244
 - attempts to, 355, 418
 - desire for, 244
 - outside of home, 419
 - of parents, 418
 - religious, 419
- Regression, 385
 - effects of, 386
- Reindorf, B., 184, 436
- Relationships, 292
 - social, 122, 218, 240
- Religion, 342, 343
 - in late childhood, 347
 - interest in, 354
 - Religion, need for, 361
 - teaching of, 357
 - Religious activities, 351, 356
 - Religious adjustment, 361
 - Religious appeals, 353
 - Religious atmosphere, 352
 - Religious attitudes, 343-344, 346, 349-350, 352, 356
 - Religious awakening, 352-354
 - Religious beliefs, 343, 350-353, 355, 362
 - Religious clarification, 353
 - Religious comprehension, 342
 - Religious concepts, 342, 345-348, 352
 - Religious conversion, 355, 356
 - Religious development, 343
 - Religious doctrines, 359
 - Religious doubt, 345, 348, 357, 359
 - Religious experiences, 357, 361
 - Religious ideas, 343, 344
 - Religious instruction, 343
 - Religious interests, 342, 350
 - Religious organizations, 352
 - Religious propositions, 359
 - Religious reconstruction, 360, 361
 - Religious services, 348
 - Religious stories, 349
 - Religious subjects, 344
 - Religious teaching, 343, 345
 - Religious thinking, 351
 - Religious training, 342, 359
 - Religious work, 336
 - Renaissance, 2
 - Repression, 201
 - Reproductive organs, 120
 - Reproof, 236
 - Republic, 14
 - Responses, emotional, 187-189, 191-192, 195, 353
 - general, 85, 87
 - Respiratory system, 116
 - Resentment, 188
 - Resistant behavior, 228
 - Responsibilities, 403
 - Restlessness, 103, 122, 240
 - Restrained, social, 195
 - Retrospective method, 15
 - Retrospective study, 356
 - Reverence, 343, 346, 351
 - Revolt against authority, 122
 - Reward, 332, 334-335
 - Rhythm, 416
 - Rice, S. A., 149, 448

Ricketts, A. F., 151-152, 203-205, 448
 Riddle, 417
 Rivalry, 224, 228, 237
 Rolling, 138, 111
 method of, 138
 Romances, 273, 354, 374
 adolescent, 205, 400
 childhood, 370-371
 forbidden, 384
 Romantic love, 377-379
 expression of, 381
 Rome, 2
 Romping, 241
 Ross, B. M., 207-208, 448
 Rousseau, J. J., 4, 12, 14, 448
 Rowdyism, 235
 Ruckmick, C. A., 337, 431
 Rudeness, 243
 Rules, function of, 330
 Running, 147, 241
 Running away, 189
 Running races, 241
 Russell, R. W., 288, 448
 Rust, M. V., 228, 448

S

Sadistic behavior, 394-395
 Salivary glands, 55
 Sanders, M. K., 220, 436
 Santa Claus, 319
 Sarcasm, 207
 "Scariness," 195
 Scarlet fever, 123
 Schaltenbrand, C., 138, 449
School of infancy, 3
 Schools, 336
 high, 336
 junior high, 336
 Scolding, 333, 392
 Scott, A. W., 149, 433
 Screaming, 177, 189, 204, 228, 399
 Scribble, 137
 stage, 412
 Seago, M. V., 247, 275, 449
 Sebaceous glands, 60
 Secondary sex characteristics, 115, 120
 Secret language, 171-172, 399
 Secret societies, 238
 Self-assertion, 422
 thwarted, 397
 Self-assertiveness, 243, 340

Self-care, 153
 Self-confidence, 250
 "Self-conscious" stage, 413
 Self-consciousness, 122, 150, 224, 242, 414, 417
 Self-expression, 397, 401, 411, 414, 416-417
 desirable outlets for, 397
 forms of, 398, 412, 418
 social attitude toward, 398
 Self-feeding, 134-137
 Self-government, 336, 404
 Self-sacrifice, 355-356
 Semen, nocturnal emission of, 120, 121
 Sender, S., 240, 438
 Sense organs, 56, 95
 condition of, 95
 development of, 66
 Sensitivities, 94, 98
 of the newborn, 94
 method of studying, 95
 Sensory exploration, 289
 Sentences, 173-175
 complete, 174
 forming, 173
 "single word," 173
 Sentiments, 215, 349
 aesthetic, 215
 social, 215
 Sermons, 319
 "Set," 233, 238
 Sewall, M., 205, 207, 449
 Sex, 40, 44, 186, 215, 250, 282, 366
 determination of, 49, 62
 development of, 212, 363, 368, 372
 differences in, 135, 172, 180, 182-183, 207, 233, 276, 282-283, 303, 418
 expressions, 363
 interests in, 365, 389
 knowledge about, 389
 opposite, 363
 pathological manifestations of, 363
 predicting, 62
 preferences, 367
 questionnaires about, 386-389
 Sex antagonism, 368-370, 372
 Sex apparatus, 118
 Sex aversion, 372-373
 Sex behavior, 366, 371
 Sex delinquency, 248
 controlling, 62
 Sex drive, 384-385

- Sex, thwarting of, 385
 Sex education, 389-391
 Sex life, 363
 Sex-linked characteristic, 136
 Sex organs, 59, 122, 386, 392
 Sexual delinquency, 340
 Sexual development, 396
 Sexual ducts, 58
 Sexual intercourse, 378
 Sexual inadjustments, 391, 394-395
 Sexual maturing, 102, 240, 350, 365
 Sexual pleasure, 395
 Sexuality, 365-366, 372
 "Shady stories," 183
 Shaffer, L. F., 287, 449
 Sheldon, W. H., 244, 449
 "Shelter," 122, 240
 Sherman, I. C., 34, 77, 91-92, 94, 99, 130, 449
 Sherman, M., 34, 77, 91-92, 94, 99, 130, 449
 Shinu, M. W., 5, 449
 Shirley, M. M., 10-11, 15, 24, 28, 33, 98, 126, 129, 140, 142, 144-145, 152, 156, 161, 164, 174, 182, 200, 221, 222, 250, 260, 367, 449-450
 Shoes, 135, 147
 Shouting, 177, 399-400
 "Show-off," 170, 378
 age of, 44
 tendency to, 397
 Showing-off, 220, 400
 Shuttleworth, F. K., 269, 274, 335, 340, 352, 369, 450
 Shyness, 150, 200, 224
 Sibling, 206
 "Sidedness," 136
 Sight, 96
 Simon, Th., 9
 Simpson, M., 212, 450
 Singing, 416, 418
 Singletons, 186
 "Sissy," 177
 Sitting, 30, 152, 154
 method of, 138
 Sitting alone, 138, 144
 Sitting down, 139
 Size, perception of, 294
 "Sizing up," 300-301
 Skating, 148
 Skepticism, 345, 350
 Skeptics, 342
 Skilled movements, 128, 148, 154
 of the hands, 137
 Skills, 148-150
 following walking, 147-148
 norms of motor, 148
 repertory of, 149
 Skin, 98, 120-122
 sensitive, 98
 Skipping, 147, 241
 Slang, 170, 172, 400
 in adolescence, 170
 ages of, 172
 vocabulary, 170
 Slavens, G. S., 322, 450
 Slawson, J. D., 338, 450
 Sleep, of the newborn, 80
 length of, 80
 poor, 123
 posture, 81
 Slurring, 179
 Smalley, R. E., 207, 450
 Smartness, 348
 Smell, 66, 98
 Smiling, 128-129, 189, 209-211, 222, 300
 "social," 129, 309
 Smiling reflex, 129
 Smith, G. F., 153, 450
 Smith, M. E., 96, 151, 172-173, 175, 181-182, 184-185, 290, 450-451
 Smith, T. L., 364, 381, 408, 451
 Smoking, 183, 327, 401
 Snake, 191
 Sneezing, 90
 Snobbishness, 237, 243
 adolescent, 237, 243
 adult, 238
 Sociability, 244
 "Sociables," 348
 Social adjustment, 123, 300
 Social approval, 232
 Social attitude, 123, 308
 Social behavior, 221, 232-233, 244
 beginnings of, 221
 in early childhood, 225
 early forms of, 223
 expectations of, 220
 forms of, 227, 235
 Social concepts, 301
 Social consciousness, 233
 Social contacts, 136, 137, 321
 Social cooperation, 224

- Social development, 218, 233
 in adolescence, 242
 meaning of, 218
 pattern of, 219-220
 Social discrimination, 237
 Social environment, 183
 Social group, 102, 218, 303, 397
 Social imitation, 201
 Social incentives, 237
 Social intelligence, 237
 Social participation, 226
 Social perception, 300
 Social play activities, 258, 284
 Social pressure, 200
 Social reactions, 223
 Social relationships, 122, 218, 240
 Social restraints, 195
 Social service work, 335, 355
 Social sex development, 368
 Social situations, 150, 209
 Social smile, 309
 Social stimulation, 188, 205
 Socialization, 238
 Socialized speech, 181-182
 Socks, 135
 Soliloquies, 181
 Solitary independent play, 227
 Songs, 416
 preferred, 417
 Sontag, F. L., 451
 Space, judging, 293-294
 Spanking, 332
 Spaulding, C. B., 252, 451
 Specific activities, 81-85, 123
 Specific movements, 154
 Speed of movement, 142, 148
 increase in, 149
 studies of, 149
 Speech, 157, 236, 337, 342
 bilingual, 185
 content of, 180
 criteria of, 157
 defects in, 177-178
 delayed, 183
 development of, 157, 186
 disorders of, 177
 egocentric, 181
 errors in, 177-178
 methods of studying, 158
 pattern of development, 159
 preliminaries to, 161
 sex differences in, 186
 Speech, socialized, 181-182
 true, 159
 vocabulary of, 165
 Sperm, 47, 53
 Spermatids, 50
 Spermatozoon, 49, 51, 120
 Spinal cord, 56
 "Spoiled child," 123, 216
 Spontaneous movements, 57
 Spoon, 134
 Spooning, 381
 Sports, 150, 234, 244, 267, 269, 271, 336
 Sportsmanship, 237
 Sprague, E. M., 181, 451
 Stabilimeter, 95
 Stammering, 161, 180
 Standards, moral, 330, 337
 Standing, 139, 142, 152, 154
 method of, 143
 with support, 142, 144
 without support, 143-144
 upright, 126
 Stanford-Binet test, 173, 292
 Stauforth, S. T., 239, 451
 Staples, R., 305, 451
 Starbuck, E. D., 345, 352-353, 356, 358,
 361, 451
 States, emotional, 195
 Steadiness, 148
 Stealing, 340
 food, 327
 money, 327
 Step, length of, 144-145, 147
 width of, 145, 147
 Step climbing, 148
 Stepping, 144-145, 147
 age, 145
 movements, 145, 147
 Stern, W., 8, 100, 451
 Stockard, C. R., 72, 451
 Stoke, S. M., 182-183, 451
 Stories, religious, 349
 smutty, 389
 Storm and stress, 356
 Stott, L. H., 333, 418, 451
 Strange, R., 352, 451
 "Strange age," 224
 Stratton, S. M., 216-217, 452
 Strayer, L. C., 29, 160, 452
 Stubbs, E. M., 84, 452
 Sturt, M., 298-299, 446
 Stuttering, 161, 179

- Stuttsman, R., 149, 452
 Substitutions in speech, 178
 Sucking reflex, 60, 98-99
 Suggestibility, 236, 243
 Suicide, 122, 340
 threats of, 377
 Sulkiness, 195, 204
 Sullinger, T. E., 275-276, 452
 Sun, K. H., 80-81, 83, 93, 95, 97-99, 447
 Sunday school, 336-337, 342, 345, 348, 352
 attendance of, 352
 children at, 349
 teachers of, 335, 348
 Susceptibility, to disease, 123
 to social approval, 235
 to social disapproval, 235
 Svendsen, M., 246, 452
 Swearing, 170, 172
 Sweat glands, 60
 Swimming, 30, 149
 Sympathetic behavior, 232
 Sympathetic response, 232
 Sympathy, 231, 237, 400
 self-, 410
 Syphilis, 71
- T
- Taboo, 363, 366
 Tapping, 149
 Taste, 66, 97
 Taste buds, 60-61
 Tatting, 237, 327
 Taylor, G. A., 32, 433
 Taylor, J. H., 93, 452
 Teaching, religious, 343-345
 Teasing, 122, 207, 230-231, 237, 395
 Teeth, 60, 102, 109, 113, 216
 permanent, 113
 temporary, 113
 Telling tales, 207
 Temper outbursts, 327
 Temper tantrums, 188, 196, 203, 205, 215, 400
 Temperament, 122
 Temperature, 98-99
 Tendon reflex, 60-61
 Terman, L. M., 8-10, 15, 24, 37, 39, 73, 119, 154, 166, 169, 172, 183, 246, 272, 273, 282, 283, 292, 295, 297, 299, 302-303, 338, 406, 452
 Testes, 52, 120
 Testing movement, 9
 Thirst, 100
 Thom, D. A., 453
 Thompson, H., 28-29, 163, 167, 219-220, 433, 452
 Thomson, J. L., 286-287, 413, 438
 Thorndike, E. L., 334, 453
 Thrasher, F. M., 233, 453
 Thumb opposition, 130-132
 Thumb sucking, 130, 207
 Thurstone, L. L., 277, 338, 453
 Thwarted desire, 340
 Thymus, 41, 55, 120
 Thyroid gland, 41, 55, 103
 Thyroxin, 26
 Tickling, 210
 Tiedemann, D., 4, 453
 Time perception, 297
 Time sense, 298
 Time vocabulary, 169
 Timidity, 188, 195, 224
 Tinker, M. A., 149, 434
 Tobacco, 72
 Tonal qualities, 176
 Tonsils, 216
 Tooth buds, 58
 "Toothless age," 179
 Tope, M. F., 405, 424
 Touch, 98
 Toy age, 264
 Toy play, 255
 decline in, 267
 Toy preferences, 265
 Toys, 212, 223-227, 260, 264-265, 293-294, 366
 "do-with," 265-266
 favorite, 367
 time spent on, 266
 Trachea, 55
 Tracing, 149
 Tradition, 363, 366, 372
 about masturbation, 393
 Training, influence of, 294
 religious, 342, 359
 role of, 293
 transfer of, 320
 Trent, M. E., 274, 436
 Trettein, A. W., 453
 Trial and error, 207
 "Trick" vocabulary, 168
 Truancy, 327, 340

- unk, 116, 152
 - proportions of, 110
 - Ubal pregnancy, 73
 - Tudor-Hart, B. I., 77, 97, 221-222, 436, 453
 - Tufts, J. H., 323, 330
 - Tune, 307
 - Turning, 138
 - Twins, 67, 186
 - fraternal, 68
 - identical, 67
 - nonidentical, 68
 - uniovular, 67
- U
- Umbilical cord, 54-55, 57, 64
 - Unbuttoning, 136
 - Understanding, development of, 285
 - Uneasiness, 240
 - United States Children's Bureau, 340
 - Unoccupied behavior, 226
 - Unsocial attitudes, 151
 - Upright position, 147
 - Urea, changes in, 123
 - Uterus, 54-55, 120
- V
- Vagrancy, 340
 - Valentine, C. W., 85, 453
 - Van Alstyne, D., 258, 453
 - Van Dyke, G. E., 105, 108, 473
 - Van Leeuwenhoek, 47
 - Variot, G., 152, 473
 - Veins, 117
 - Verbal app., 201
 - Verbal play, 219
 - Verruc. caseosa, 60
 - Vierordt, H., 140, 454
 - Vision, 67
 - Vocabulary, 36, 157
 - building of, 36, 166
 - color, 169
 - "etiquette," 169
 - forms of, 166
 - general, 166-167
 - money, 169
 - number, 169
 - size of, 159, 172-173, 184
 - slang, 170
 - Vocabulary, special, 168
 - tests for, 186
 - "trick," 168
 - Vocal gymnastics, 399
 - Vocal organs, 121
 - Vocalization, 88, 157, 161, 184, 211, 398
 - adolescent, 400
 - expressive, 161
 - in later childhood, 399
 - Vocational choice, 404
 - Vocational interests, 405-406
 - Voice, 119-122
 - "breaking" of, 121
 - Vreeland, F., 249, 451
- W
- Waddle, C. W., 412-413, 454
 - Wagner, I. F., 85, 451
 - Wagoner, L. C., 135, 454
 - Walking, 30, 126, 140, 142-143, 147-148, 152-154, 161, 200
 - "on all fours," 142
 - development of, 140
 - improvement in, 145
 - normal course of, 140
 - perfection of, 147
 - skills in, 145
 - speed of, 144, 147
 - style of, 147
 - stages preceding, 141
 - on toes, 147
 - when led, 144
 - with support, 143, 145
 - Walking alone, 144-147
 - age of, 144-145, 147
 - Wallace, R. F., 48, 451
 - Warden, C. J., 236, 454
 - Washburn, R. W., 209-211, 221-222, 454
 - Water-color paints, 415
 - Watkins, S. H., 322, 442
 - Watson, G. B., 347, 451
 - Watson, J. B., 3, 17, 77, 90-94, 131, 137, 192-193, 197, 199, 203, 206, 210, 454
 - Watson, R. R., 131, 454
 - Weber, C. O., 322, 455
 - Weight, 106, 115, 119, 144, 152
 - of brain, 116
 - of muscles, 115
 - overweight, 147
 - Weinbach, A. P., 145, 444
 - Weiss, A. P., 83, 455

- Wellman, B., 137-138, 149, 176, 249, 251, 294, 455
- Wells, F. L., 388, 446
- Wenger, M. A., 101, 455
- West, E. D., 182-183, 455
- Whispering, 327, 401
- Whit, R., 302-303, 455
- White House Conference Report, 337, 455
- Whitely, M. F., 268, 455
- Whopping cough, 123
- Wickens, C., 101, 455
- Wickens, D. D., 101, 455
- Wickman, E. K., 327, 455
- Williams, H. M., 248, 455
- Willis, C. B., 73, 455
- Wilson, F. T., 310-311, 426
- Winterburn, F. H., 7
- Wisecracking, 377, 400
- Witmer, L., 10, 16
- Witty, P. A., 241, 257-258, 262, 269, 274, 282-283, 349, 368, 384, 405-407, 418, 441, 456
- Wolf Cubs, 234
- Woolley, H. T., 17, 305, 456
- Word combinations, 174
- early, 174
- Words, unusual, 400
- Work, 253
- accuracy of, 236
- religious, 356
- Worry, 122
- Writing, 418
- of poetry, 418
- X
- X ray, 111
- Y
- Yawning, 87, 90
- Young, J. R., 359, 456
- Z
- Zygote, 49, 52, 54

